



October 1990

Vol. 4 N° 1

Price £2.00

# Archive

*The Subscription Magazine for Archimedes Users*



Reports from the Acorn User Show

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Public Key Cryptography

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DFS Desktop Filers Compared

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New Products Galore

*Reviews:* Archimedes' Orrery, Order & Chaos,  
Desktop Office, Redshift, PenDown, Rhapsody,  
Maps of the World, BBC Link, Nevryon,  
Arvis Video Genlock, XAT Video Utilities.

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## The Future of Archive Magazine?

The trend I noted last month has continued. i.e. the proportion of technical articles has decreased and the proportion of review articles has increased. This is good news in the sense that it is an indication of how the Archimedes is taking off. More and more software houses are deciding that it is well worth writing for the Archimedes and A3000.

"But I took out a subscription to read technical articles. Reviews are fine, but I can't afford to buy new products all the time. I want information so that I can write my own programs." Well, I have two things to say about that. Firstly, I don't want anyone to feel that they are not getting value for money. If you want to stop your subscription, we will give you a full refund for the issues you have not yet had.

Secondly, I too would like to see more technical articles in Archive. I think we all would. After I mentioned it last month, I got a few comments about what articles you wanted (see Comment Column), but **you** are the people who write the articles. I only have time to do the editing and keep the SCSI Column going. Do you think that if, like other magazines, I offered to pay for articles, we would get more people offering to write? Well, maybe, but I'm not sure what would happen to our claim that Archive is written by enthusiasts for enthusiasts.

As I said last month, if I felt that there really wasn't anything new to say about the Archimedes, I would stop publishing Archive but I don't believe that for one minute and neither, I suspect, do the majority of Archive readers. There are lots of new and exciting projects going on and lots of development work is being done, both amateur and professional, all involving the Archimedes. So, it's over to you. If you have ideas of what you would like to write about or if you think you could offer to write about any of the subjects people have suggested, let me know.

Thanks for staying with us into Volume 4. I hope you continue to enjoy and benefit from Archive Magazine. Thanks again for your continued support.



### Government Health Warning – Reading this could seriously affect your spiritual health.

"Christianity is alright for those who feel they need that sort of thing and it's OK if it helps you live your life, but I don't need it."

"Christians really shouldn't try to ram their views down other people's throats."

"Christianity is a 'crutch' for those who are unable to cope on their own."

Actually, you know, it's not easy being a Christian. If you take seriously the things Jesus said, it doesn't make you instantly popular! (Mind you, Jesus wasn't too popular in some quarters either!!)

Surely though, whether Christianity is "helpful" or whether or not you think you "need it" is irrelevant. The question is, "Is what Jesus said **actually** true?". If it isn't, then I'm making a fool of myself and wasting my time and yours but if Jesus is who he claimed to be... !

If there is even a niggling doubt in your mind that it **might** be true then why not get hold of a copy of, say, John's gospel and read it for yourself? If there's no truth in it, it won't do you any harm but if it is as radical and life-transforming as I am suggesting, it's worth thinking about. (We have some spare copies of John's gospel if you can't find one anywhere.)

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# Archive

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## Products Available

- **5.25" disc drive interface** – Digital Services produce a podule floppy disc drive interface which provides a rather more easily fitted interface than any that we've seen so far. £35 +VAT or £38 through Archive.
  - **600 d.p.i. 8 page per minute laser printer** for only £1399 + VAT (£1490 inclusive through Archive). Computer Concepts have released their new 600 d.p.i. version of the Laser Direct. It is a modified LBP8 laser printer engine with a board which fits into the Archimedes, just like the 300 d.p.i. Qume version. This printer, because it is modified specifically for the Archimedes, cannot be used on other computers. If you want to have a printer than can be used on both the Archimedes and other computers, you can get an LBP4 (which is, admittedly, half the printing speed of the LBP8) and use CC's interface board and software which can be bought separately for £350 + VAT (£370 through Archive).
  - **A3000 ram prices down again** – The 4M Atom-wide and Computerware ram upgrades have dropped in price to £320. These are the ones which adhere to Acorn's guidelines about the numbers of memory chips in an A3000 ram board.
  - **Acorn price drops** – Certain of the Acorn podules have dropped in price: Ethernet card is now £250, the floating point podule is £500 and the SCSI card is £250 (+VAT in each case).
  - **Archimedes Annual Service Kit** – Acorn recommend that you change the batteries on your Archimedes (this does not apply to A3000's) once a year. That may be a bit over cautious but if your computer is two years old, I would definitely change the batteries since spurious configuration changes can occur which you may not notice and which could cause you all sorts of hassle. Also, having had a few A310's back for memory upgrades and having seen the state of the fan filters, I would also recommend changing the filter every so often. The trouble is, alkaline batteries come in packs of four and you only need two and have you tried asking your local dealer for a replacement fan filter recently?! What we have put together is an Archive Service Kit – two batteries plus a fan filter for £2.
  - **Archimedes Learning Curve Launched** – For the same price as an A420 (new price £1299 + VAT) you can now get an Archimedes Learning Curve pack. This is not to be confused (some hope!) with "The Learning Curve" hereinafter called "the A3000 Learning Curve". The software that comes with the Archimedes Learning Curve is the same as with the A3000 Learning Curve (DR DOS, PC emulator, Genesis and First Word Plus) but with the addition of Acorn DTP. Also included in the new pack are the introductory video and a copy of "Your Child and the National Curriculum" again as included in the A3000 Learning Curve pack. Please note that neither Learning Curve includes a monitor. This has to be purchased separately. All the software is carefully laid out on the 20M drive.
  - **Archimedes Price drops** – The prices of the A420 and A440 have dropped to £1299 and £1699 +VAT respectively (£1493.85 and £1953.85). Also, the new Archimedes Learning Curve which has recently been launched adds to the complication since it sells at the same price as the straight 420! If you want a 420, it is best to buy the Archimedes Learning Curve from us at £1490 and get the Learning Curve software free as well as a £100 Archive software voucher. If you want a more powerful machine, we can swap the 20M drive for a 40M or a 47M drive for £210 or £290 respectively and we can upgrade the memory to 4M for £120. If you want the 20M drive replaced with a SCSI drive instead of an ST506 drive we can allow you £120 off the price of the SCSI drive. So, for example, you could have it with a 45M SCSI by adding £405 or an 80M by adding £630.
- So, if you want a Learning Curve 440 equivalent, it will cost you £1490 + 290 (drive upgrade) + 120 (memory upgrade) = £1900 which works out cheaper than Acorn's own A440 price without the extra software. If you really don't want the software then you can buy an upgraded A410 from us for £1260 + £180 (3M ram) + £390 (47M drive) = £1830 and so you save yourself £70. If you are thinking of buying an Archimedes Learning Curve or an upgraded A440 Learning Curve, note that the software is supplied on the hard disc, not on separate floppies, so I don't know how you stand legally if you are



thinking of selling the software on to someone else. I suspect that it may be a breach of the licencing agreement under which Acorn sell you the software.

- **Arclight** – an extremely fast multi-tasking ray tracing package for Euclid users. It is now available for £50 inclusive from Ace Computing (£46 through Archive).

- **ARM3 upgrade** – Aleph One have improved their ARM3 upgrade and reduced the price again. It is now on a board just 50mm x 60mm and stands only about 6mm above the ARM 2 chip socket so that there should be no more problems of incompatibility with anything. They have achieved this amazingly small size by using surface mount components throughout. The price hasn't shrunk in quite the same proportion as the size(!) but it is down to £449 +VAT or £460 through Archive. (See Comment Column on page 13.) It also means that if you can find someone who owns a surface mount re-work station, you could, in theory, replace the ARM2 on an A3000 with an 84 way socket and then put in an ARM3 upgrade.

- **ARM3 upgrade** – CJE Micros are now also selling ARM3 upgrades for the A300/400 computers. The upgrade has two extra features to make it stand out from the opposition. Firstly, the ARM3 is in a sub assembly so that it can be replaced when other ARM chips and/or floating point units become available and secondly, though the chip is run at 30MHz, you can buy a "Super Booster" which will increase the speed to "34, 36, 38, 40... MHz". (See Comment Column on page 14.) The prices are £500 (inc VAT) for the upgrade and £34.50 for each Super Booster. The ARM3 itself will be available through Archive for £465 but the Super Boosters are only available through CJE Micros.

- **Ballarena** – the first game from the French Archimedes software house, Eterna. At £19.95, it is an all action arcade type game with some excellent background music.

- **Business Accounts from Minerva** – For £99.95 (inc VAT) each, you can buy modules for Minerva's new business accounts system: Stock management, Order processing and invoicing, Sales ledger, Purchase ledger and Nominal ledger. If you want all five modules, they can be bought for £399.95 (inc VAT). (Archive prices are £90 and £350 respectively.)

Although these are re-vamped programs, they are not, I gather, multi-tasking.

- **Careware Disc 9** – Fast Julia and Mandelbrot generator, desktop fractals, 3-D ray traced Julia and Mandelbrot sets.

- **Computerware A310 memory upgrades** are still available through Archive despite Computerware's demise. We have a few in stock at the moment.

- **Datavision** is Silicon Vision's relational database management system consisting of label printing, reporting, word-processing and mail-merging facilities in one integrated environment. It costs £149.95 from Silicon Vision or £130 through Archive.

- **Dust** – Educational software house, Resource have produced a new mathematics program called, Dust. It is designed for upper junior and lower secondary age children. On an "eye-catching journey through the solar system" you are faced with various mathematical puzzles. It is set up as 10 chapters with supplementary activities and a teacher's guide. The price is £30.50 +VAT (or £22.50 if you buy 10+) or £32 inclusive from Archive.

- **EdScheme Lisp Compiler** – Lambda Publications have produced a Lisp incremental compiler for the Archimedes for just £37.50. It has been recommended to us by Mr A Angus of Blyth, Northumberland as a good self-study course in computer science when combined with Abelson & Sussman's "Structure & Interpretation of Computer Programs".

- **Financial Accountant** from Silicon Vision provides order processing, invoicing, sales ledger, purchase ledger, nominal ledger, cash book, stock management, reporting, VAT analysis, trial balances and profit analysis all in one package. It costs £275 from Silicon Vision or £245 through Archive.

- **Flexifile** – Minerva's latest offering in the database area is now available at £149.95 inclusive (or £130 through Archive). It is a "simple to use, multi-tasking, relational database".

- **Gate Array Design & Teaching system** provides an introductory course for teaching silicon chip design including array design, cell design and a tutorial on IC design. The price is £149.95 from Silicon Vision or £130 through Archive.

- **!Help** – The Teacher's Guide to the Archimedes from Sherston Software reviewed last month (page 40) has gone up in price from £4.95 to £7.95.

• **Impression II** – should be available by the time you read this. The price is £169 + VAT or £175 through Archive. It will take some time to clear the backlog of orders, so please be patient.

• **Interdictor II** is now available from Clares Micros at £34.95 (£32 through Archive). When compared to Interdictor I, it has better landscaping, the flight simulator is much improved, there is a new game scenario, a greater variety of enemy targets and a computer analysis of the state of the plane in flight. It is not an upgrade of Interdictor I but is a completely new product with, sadly, no upgrade path.

• **Jetstream** from Digital Services is a 30M tape-streamer at a very reasonable price – £599 + VAT or £640 through Archive. It is not a SCSI device but consists of a podule, to which the streamer is connected, and front end software driven from an icon on the icon bar. It has the added advantage that the podule can also be used as a 5.25" external disc drive interface. The streamer itself takes either 20M or 30M tapes and can back up drives larger than the tape size by using multiple tapes. It runs at 1.5Mbyte/minute, i.e. 13 minutes to back up a 20M drive or half an hour to backup a 45M drive.

(This is a somewhat slower, but rather cheaper, alternative to the Oak 60M tapestreamer at £1100. However, if it is a SCSI drive you want to backup, a 42M removable drive at £680 is a much better alternative as it can be used as an ordinary drive as well as being used for backup purposes.)

• **Join the Jet Set!** – ZCL Ltd are launching a package aimed very aggressively at the games market. They are putting together an A3000 and a high quality TV modulator with Interdictor, Superior Golf, Trivial Pursuits and Euclid for £650 + VAT. (£710 through Archive.) A great idea for a Christmas present!

• **Joystick Interface** – You can now use your favourite joysticks from Amiga, Atari or whatever, on the Archimedes. This interface fits into the Econet connectors on the Archimedes or A3000 and has special software which allows you to use two joysticks to run applications that were intended to be mouse or keyboard based. (Fitting such a joystick interface will, of course, void your warranty.) These are available from RTFM Software in Jersey for £34.99 inclusive.

• **Laser Direct and ArcLaser supplies** – We can now supply toner cartridges (£75) and replacement drum sets (£95) for the Laser Direct and ArcLaser.

• **MCP is a lighting and special effects management system** designed for discos, etc. It can handle up to 512 channels on a single core cable with 1 to 5kW dimmers with an easy-to-use management system run from an Archimedes. This system is available from S.P.E.M. in Torino, Italy.

• **Mouse splitter from Voltmace** – If you are fed up with having to unplug the joystick and plug your mouse back in again after the kids have been playing games on the computer, here is the answer! Voltmace have produced a simple switch box into which both the mouse and the joystick can be plugged. A toggle switch then selects which is active at any time. This will save a lot of hassle and will remove the likelihood of a broken mouse or joystick plug caused by continued plugging and unplugging. For A3000 owners, this is particularly useful – I don't think Acorn could possibly have found a more awkward place to put the mouse socket, do you?! The only problem for A3000 owners is that, at least on the sample switch box I was sent, the cable is so thick that the computer won't sit properly on its feet! I have told Voltmace about this and am hopeful that they will use a thinner cable in future. These boxes are £19.95 inclusive (or £18 through Archive).

• **Office Tools** is a combination of Silicon Vision's packages: Datavision, ShareHolder, Financial Accountant and the Presentation System. It costs £375 from Silicon Vision or £320 through Archive.

• **!Orrery** is Spacetechn's latest application. As I am sure you all know(!), an orrery is a device (originally mechanical) for displaying the solar system showing the orbitals of all the planets. This application allows you to view the solar system with an accurate backdrop of stars and zoom in and out and to look at it from different places both within and outside the solar system. £95 + VAT from Spacetechn. (More information on page 55.)

• **PipeMania** comes to the Archimedes – Entertainment International have now transferred Pipemania, the well known Amiga/Atari/Spectrum etc game, onto the Archimedes. You have to direct the pipework around the screen before the slime reaches the last piece of pipe you have laid! £23 through Archive.



• **Removable SCSI hard drives** – we are now stocking MicroNet 42M removable SCSI drives as well as the Oak ones. These drives are considerably faster than the Cumana 20M removable drives and are about the same speed as the standard Oak fixed SCSI drives. Indeed, in the higher resolution modes, they are faster! The Archive price for a drive without a podule, but including the cables and one 42M cartridge is £680 inc. VAT and the spare cartridges are £80 each. If you buy it with an Oak SCSI card, it comes out at £870. More details in the SCSI Column on page 47.

• **Rhapsody** is Clares' new music notation package supporting Midi input and output, editing and printing of musical scores. The price is £49.95 or £46 through Archive. See the comments on page 43.

• **RoboLOGO** is Silicon Vision's own version of Logo providing 3D movement of an on-screen robotic figure (no hardware turtle equivalent, I'm afraid). This package costs £99.95 from Silicon Vision or £90 through Archive.

• **Schema** – Clares have taken over Acorn's multi-tasking spreadsheet, Schema, and it is now available for £129.95 inclusive or £110 through Archive. It sounds extremely powerful but we haven't yet got a review copy. As well as the normal spreadsheet functions, it also has some graphical output – bar, line, area and pie.

• **ShareHolder** is Silicon Vision's share management system for the small investor which will allow you to automate your portfolio. It costs £195 from Silicon Vision or £160 through Archive.

• **Shareware Disc 33** – is a music disc with twenty tunes for Maestro, three utilities and seven tunes for soundtracker, a computerised metronome and a midi monitor. The soundtracker utilities are: one which separates samples and songs from soundtracker modules, one which plays a soundtracker module and one which allows the user to control the way in which the module is played.

• **Shareware Disc 34** – contains !Draw+ (a much improved version of !Draw), 38 lineart draw files, a converter to change outline fonts into bitmap fonts, a screen mode info module, a converter from !Paint 256 colour numbers (0-255) to RGB values, a Pipe-Dream to Impression converter, an update to !Printer-PS, a pound printer utility and PrintUtils for FX-80.

• **Shareware Disc 35** – contains a desktop cassette inlay printer, a packet radio program, a desktop front end for Wingpass Assembler, a desktop dustbin, a desktop find file, a routine which converts BASIC programs into application code, a desktop disassembler, a desktop front end for Acorn's Squeeze utility, an iconbar clock and some files relating to a geothermal energy project (explained in the Help!!! Section on page 16).

• **Silicon Vision** price rises. Unfortunately, Silicon Vision has felt the need to increase the prices of much of their Archimedes software. The new prices, including VAT, are as follows, the Archive prices being in brackets after each one.

Arc-PCB	£195	(£160)
Realtime Solids Modeller	£195	(£160)
Solid CAD	£149.95	(£130)
FilmMaker	£99.95	(£90)
Solids Render	£149.95	(£130)
RoboLOGO	£99.95	(£90)
Gate Array Design System	£149.95	(£130)
Super Dump	£29.95	(£28)
RiscBASIC Compiler	£149.95	(£130)
RiscFORTH Compiler	£149.95	(£130)
Super-Plot	£39.95	(£37)
ShareHolder	£195	(£160)
Datavision	£149.95	(£130)
Financial Accountant	£275	(£230)
Office Tools	£375	(£320)

• **Solids Render** is Silicon Vision's multi-tasking ray-tracing software which works with their Film-Maker to produce animations. Can be used to ray-trace the output from SolidCAD and Realtime Solids Modeller. The price is £149.95 from Silicon Vision or £130 through Archive.

• **SuperDump** is printer driver from Silicon Vision for use with Epson compatible printers. Images can be scaled, positioned and previewed before printing. This package costs £29.95 from Silicon Vision or £28 through Archive.

• **SuperPlot** is a plotter driver from Silicon Vision which supports HPGL, Graphtec, Watanabe and Plotmate plotters amongst others. It is compatible with all of Silicon Vision's graphics packages. It costs £39.95 from Silicon Vision or £37 through Archive.



• **Taxan 14" multisync monitors**—new to the price list this month is Taxan's new 795 colour monitor with the flat screen Trinitron tube. Anyone who saw it on display will agree that the quality is even better than the Eizo 9060SZ (.28mm dot pitch). This is partly due to the closer dot pitch (.26mm) and partly due to the new Trinitron technology tube. The Archive price is £590 inc VAT and carriage. Note, however, that this monitor, unlike the Eizo 9060SZ will not work in modes 17 and below unless a VIDC enhancer (£34 through Archive) is fitted to the computer. (See the Hardware Column on page 21 for further comments.)

• **Taxan 20" multisync monitors**—also new to the price list this month is Taxan's 20" colour monitor,

the Taxan Multivision 970. It is a BIG monitor with .31mm dot pitch which, on a 20" screen represents very high resolution. The Archive price is £1690 inc VAT and carriage. The price includes a free VIDC Enhancer.

### Review Software Received...

We have received review copies of the following software: Noah Tools #1, #2 & #3, Noah Demos #3, Ballarena, WorraCAD, PipeMania, CAST Nominal Ledger, Dust, EdScheme Lisp Compiler, Joystick Interface.

Also, if people would like to review some of the later Shareware or Careware discs, please let me know. Please DO NOT send in unsolicited reviews of these discs or I could be inundated. **A**

## Contact Box

• **Bromley Arc Users** — Mr G. Gaunt would be interested to contact any Archimedes users in the Bromley area. Phone 081-462-6001.

• **Computer Assisted Art** — Anyone interested in ray-tracing, geometric patterns, Mandelbrot's etc, ordinary art/sprite tools, mapping surfaces, BASIC or ARM-code 3D surface texturing, fractal landscapes etc contact D.P.Allen, 12 Grove Farm Park, Mytchett, Camberley, Surrey GU16 6AQ.

• **Derbyshire Archimedeans?** — Is there an Archimedes' user group in Derby or South Derbyshire? If so, please contact Barry Thompson at Lantern Pike, 8 Old Gate Avenue, Weston on Trent, Derbyshire DE7 2BZ.

• **Hypermedia Interest Group** — There is a local Hypermedia Interest Group being formed in Bristol. If anyone is interested, contact Dr John Maher at the School of Chemistry, University of Bristol BS8 1TS.

• **Midlands Area User Group** — Run by Neil Berry, 21 Pargeter Street, Stourbridge, West Midlands DY8 1AU. (0384) 373111. The group is restricted to owners of Archimedes of any sort but not BBC B, B+ or Master users. Number of members to date: 42. Ages of members: 17 — 73.

General group interests: The exchange of PD software, Writing software, Econet use, DTP, RISC-OS Applications, Electronics, SCSI, Games!

Main aims of the group: After running the group for a number of months, I feel that, as we are still informal and contact each other either on the phone or, more usually, in a letter, the main aim of the group is to help anyone in difficulty. Aside from my own knowledge of computing, the other members of the group form a very wide ranging 'database' of information about the Archimedes computer and are usually able to help with any problem. If you want more details, contact Neil Berry.

• **Wakefield BBC Micro User Group** Forthcoming Attractions...

On November 7th, Computer Concepts are doing demonstrations of software and hardware and, on December 5th, we have our Annual Bring and Buy Auction, where lots of bargains can be had (note: original software sold, no copies allowed) in time for Christmas. On February 6th we have Tony Kiddle of Resource due to come with educational software. The venue as always is Kingswell Suite (1st floor) Homefield House, Holmefield Park, off Denby Dale Road (A636), Wakefield. Start 7.30 p.m. until finished (9.30 p.m. approx). It costs just 75p on the door to get in and we produce a newsletter.

For further information contact Chris Hughes on 0924 379778, Andrew Kaye on 0924 250764, or Rick Sterry on 0924 255515 (evenings and weekends only).

*ideA*

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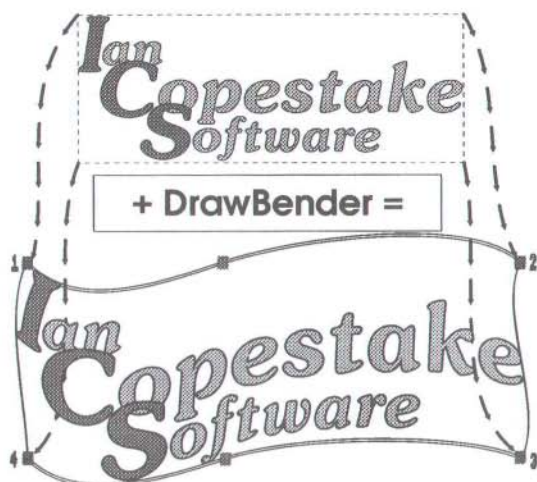
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## Hints & Tips

• **160k ADFS discs for the Archimedes?** If you have upgraded to the Archimedes from a Master, or even a Beeb with ADFS, you might have some 5.25" discs you want to transfer. According to the manuals, the Archimedes will only read and write to 640k (L) format, Arthur 800k (D) format, or the RISC-OS 800k (E) format using either 3.5" or 5.25" discs (80T). However, the Master could read and write 40T 160k (S) format, 80T 320k (M) format, or 80T 640k (L) format discs. I discovered by accident that the Archimedes will quite happily read 5.25" 160k (S) discs in 40T mode, and in fact save them – I have not been able to try out 320k discs since I do not have any. You cannot, however, format discs at either 160k or 320k on the Archimedes but then why would you want to anyway? Chris Hughes (Wakefield BBC Micro User Group)

• **Apocalypse Tips** – Progressing from planet to planet is really simple. At the start of the game, a map of your selected planet is displayed. All the objects on the planet's surface are represented by coloured dots, about 80% of which must be destroyed for your craft to be withdrawn and for you to be allocated another planet.

As you progress through the game and return to the 'Guild of Spacings', you will be given various additions for your ship. These include a super-cooler for your laser-cannon and better shielding. It is vital that you have these if you intend to progress at a reasonable pace, so it is advisable to get them as soon as possible. Remember, you can only return a maximum of five times before being rejected by the Guild. When you have destroyed your 80% or so, you will automatically be withdrawn by the Guild – this may take some time so don't give up too quickly!

If you prefer rather more action and less running away, the following lines of the BASIC file '!Apocalypse.Apocalypse' can be changed.

Line 290 is your starting score.

Replace line 330 with: 330 !shieldcharge=16 : !rapidturnF=1: !guntempcooler=0

Now delete lines 340 to 380 inclusive for all the extra features and (very) strong shields.

Replace line 770 with: UNTIL 0 for infinite lives.

At line 1970 limpcounter is the number of objects you have shot, which determines how many you have to go before advancing to the next planet. For instant withdrawal, replace 1970 with: 1970 limpcounter=10000.

Line 6910 is how many times you can return to the guild before rejection (this is normally 5).

• **HFORM v1.72 bug or feature?** If you try to format an ST506 hard disc that has had a different profile (e.g. it was used on a PC before hand) with the Acorn HFORM program supplied on the RISC-OS Supplement Disc, the new disc shape option will not be acknowledged and so the full capacity of the drive may not be realised. This can be overcome by removing line the line that reads:

```
2130 IF cyl%=0 IF head%=0 IF
Formatted% GOTO 2180
```

Brian Oliver

• **Hostages cheat mode** – If you hold down the <R>, <U>, <I> and <H> keys once the title screen has loaded and press <return>, you will enter into the cheat mode. This allows you to jump to either section two or three of the game with three hostages and seven terrorists.

• **RAM discs for the PC Emulator** – It is possible to create a hard disc partition in any filing system. For example, by altering the !PC.!Run2 file so that the path for Drive D is 'RAM:\$RamDisc' and using the FDISK program to create a RAMFS hard disc partition, you can obtain any size RAM disc you require – memory and pages sizes permitting. Michael Ben-Gershon

• **Reading a system variable from BASIC** – The question was, "I've got a system variable being set in the !Run obey file:

```
Set MaxNumberOfFonts 32
```

and I want to be able to read this value into a BASIC variable but when I use:

```
value% = VAL("<MaxNumberOfFonts>")
```

it produces the error 'Variable not found', because it takes the '<' character as meaning 'less than' rather than 'start of system variable'. Using the BASIC keyword EVAL has the same effect."

The first thing we need to do is to extract the value of the system variable into a string that we can manipulate. After searching through the PRM volume II, I eventually found OS\_ReadVarVal (SWI &23) on page 750. On entry, R0 points to the name of the system variable to be read, R1 points to a suitable buffer to store the string in, R2 is the maximum length of this buffer, R3 is set to 0 to use the first occurrence of the named system variable, and R4 is set to 3 so that an expanded string is returned in the buffer.

On exit, we should now have the value of the system variable in the form of a string. The next task is to convert this string into an integer, and this is easily performed by using OS\_ReadUnsigned (SWI &21) on page 585. On entry, R0 is set to 0 so that the base number used is assumed to be 10 unless the string indicates otherwise, R1 is the pointer to the string (note that this is the same as R1 for OS\_ReadVarVal, which is preserved on exit). On exit R2 contains the value of the system variable as an integer, using only two SWI calls.

This is easily implemented in both BASIC and ARM assembler.

In BASIC this can be achieved with 4 instructions:

```
MaxBufferLength = 16
DIM BufferPtr MaxBufferLength
SYS "OS_ReadVarVal",
    "MaxNumberOfFonts", BufferPtr,
    MaxBufferLength, 0, 3
SYS "OS_ReadUnsigned", 0, BufferPtr
    TO ,, value%
```

and if you want to do in ARM assembler, then only eight instructions are necessary:

```
...
ADR R0, SystemVariablePtr
    ; point to system variable
ADR R1, BufferPtr; point to buffer
MOV R2, #MaxBufferLength ; length
    of buffer
MOV R3, #0 ; use first one found
MOV R4, #3 ; expand fully
SWI XOS_ReadVarVal ; R1 preserved
MOV R0, #0 ; use default base
SWI XOS_ReadUnsigned ; R2 = value%
...
```

```
SystemVariablePtr
= "MaxNumberOfFonts", 0 ; note
    no '<' or '>' are used
ALIGN
MaxBufferLength * 16
BufferPtr % MaxBufferLength ;
    reserve MaxBufferLength
ALIGN ; bytes of workspace
```

To give a quick example of its use: 'Set MaxNumberOfFonts 16' gives value% = 16 'Set MaxNumberOfFonts &20' gives value% = 32

This may be of use to programmers, as it allows constants to be set up in the !Run obey file and users can modify them to fit their requirements, without having to modify the program itself. John 'Lofty' Wallace.

- **System Variables for the Filer Module** (Archive 3.11 p7) – The problem with the Filer module not allowing you to include system variables can be solved a lot easier (and without taking up any valuable RMA space).

I like to use icons for the directories which contain the third party applications, demos, utilities, etc. This meant using an application directory and I wanted a general purpose !Run obey file to open the directory viewer (using Filer\_OpenDir). However, I came across the same problem as Simon Callan. The solution I present here was passed on to me by Paul Fellows (who wrote 'Archimedes Basic Compiler' amongst other things) and so I don't wish to take the credit for such a neat idea.

So that I don't have the !Run, !Sprites, etc. with the actual programs I want to view, I create a directory '\_' inside that application directory to hold them. Thus, my !Run obey file reads as follows:

```
!Run obey file
|
IconSprites <Obey$Dir>.!Sprites
Set Alias$OpenDir Filer_OpenDir
    <Obey$Dir>._
OpenDir
```

Setting a command string as an 'Alias' will expand any system variables within that command string. This gets around the problem which Simon describes, and also means that you don't need to run a program every time you switch the machine on. John 'Lofty' Wallace **A**





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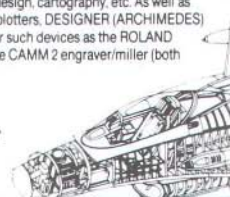
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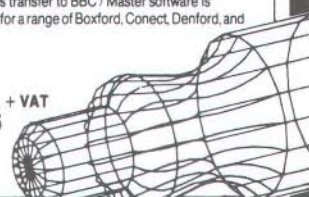
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## Comment Column

• **30MHz ARM3 Upgrade** – When the price of the ARM3 from Aleph One dropped by £100, (£599 to £499 +VAT) I ordered one from them. At the time, they were moving to a new package for the chip and some delay resulted – but when they sent my upgrade to me, it had dropped a further £50 in price! This shows an excellent sense of business morality on the part of Aleph One. They also supplied me with an 84-pin PLCC chip puller, the best tool of the type I have seen, which I can send back after use for an almost full refund. A nice company to deal with!

The upgrade is a small, high quality circuit board with, on top, an ARM3 chip, a 60MHz crystal, a little logic and a lot of decoupling capacitors and, on the bottom, a plastic former surrounded by pins to go into the ARM2 socket. The plastic former and the pins looked very robust. However, although the instructions suggested that the upgrade be performed without removing the main pcb – I preferred to take mine out, as inserting the ARM3 board required a fair amount of force.

The cache and 30MHz clock are enabled using the application !ARM3, supplied on floppy and worked first time. The application installs a module and an icon on the icon bar – a hare for fast (cache on), a tortoise for slow (cache off). Clicking on the icon toggles the speed, which may also be set from the command line or from a program. A different module (supplied) has to be used for a Unix system. A new configure option allows the cache to be switched on or off, as desired, on installation. On a hard disc machine, the application !ARM3 can be run during the boot sequence.

The instructions supplied detail the SWIs provided by the ROM. These would allow the experienced programmer to fine tune the cache performance, but will not often be used. It is, however, nice to have them available.

The performance is excellent and I have not found any application which does not work with the cache enabled.\* A few examples: a 6s Logistix recalculation now takes 2s; SI (Norton Utilities) on the PC emulator gives a rating of 4.2, up from 1.0; the PC emulator is much nicer to use and feels like a real

computer; an Acorn DTP document appears on the screen in 14s instead of 29; Maestro displays scroll smoothly; playing a Maestro tune does not render the machine virtually unusable (!Usage shows the difference very clearly); my boot up sequence takes half the time, and so on.

In fact, the machine feels faster in every way. For the benefit of a friend, we measured the speed up obtained using the ARM3 in a variety of display modes. We used some PCW benchmarks, which give speeds for various operations – screen update, computation, (hard) disc use, memory use – and an Index providing a basis for overall comparison. The table below shows the results. The table shows the new speed in each mode relative to the original speed in the same mode, so a '2' would mean a doubling of speed. The reference is the same machine before the ARM3 was installed but with a MEMC1a already present.

Mode	Screen	Comp	Disk	Memory	Index
0	2.4	3.9	1.0	4.2	2.5
12	2.6	4.3	1.6	4.3	2.9
15	2.8	4.9	1.6	5.1	3.3
21	2.7	5.9	1.3	6.1	3.3
24	3.0	7.6	1.6	7.7	4.1

Mode 21, for instance, is overall 3.3 times faster with an ARM3 than without – meaning that it now runs at about the speed of mode 15 without the ARM3. The machine feels as fast as these measurements suggest it should.

I wholeheartedly recommend this upgrade – if you can afford it, buy it! Sean Kelly, Hanwell.

*\*We have a BASIC program that generates an error when the ARM3 cache is ON but not when the cache is OFF. It is the 'purge' routine in the Archive members' database program that Adrian Look wrote for us. If we do not switch the cache off before running the purge, it comes up with a 'type mismatch' error. This happens during very heavy use of the (SCSI) disc drive when shunting the data around. Anyone any ideas why? With 7,000+ records on the Archive database, it takes several hours to do the purge, so having the cache on would make a significant time saving. Ed.*



• **A540 shortage**—It looks as if Acorn have grossly underestimated the demand for the new A540 Archimedes. They said at the press launch that they would have 100 by the end of September and be able to “ramp up” the production in October. I put in an order for two even before Acorn had actually told the distributors that they existed! Over the last couple of weeks, I have increased that order to six and have orders from subscribers for two of them already. I spoke to an Acorn representative on 27th September who said that Acorn had only actually got 20 available for sale! The distributors already have orders from dealers for several hundred A540's so I guess that if you want one before Christmas, you are going to have to act fast. If anyone wants to order any of the four remaining ones I have got on order, drop us a cheque which we will hold until we are able to supply. (£2995 + VAT = £3444)

The 4 Mbyte memory modules for the A540 are being advertised by Acorn at £500 + VAT each but it might be worth waiting until the likes of Atomwide produce their second source versions.

• **ARM3 Super Boosters Rule OK?** — In order to get the edge on the opposition, CJE Micros have made the ARM3 chip removable so that it can be replaced by an ARM4 or whatever — seems like a good idea to me. However, they have also added an option which allows you to add a second, higher speed clock (a “super booster”) to the board and they have provided a means of software switching between the 30 MHz clock and the higher speed one. This sounds a good idea on the face of it but it is important to think out the implications.

What they are suggesting is that you run the device above its rated value. That is OK provided you don't over do it. If the chip is quoted as being able to run at 30MHz then, clearly, it is not likely to die on you if you increase the speed to, say, 32 MHz but what happens if you run the ARM3 too fast? The answer is that, as you increase the speed, the chip will run hotter and it is also more likely to malfunction.

(I asked CJE Micros what would happen if the chip over-heated and was damaged and they assured me that you would be covered by CJE's warranty. They reckoned that VLSI Technologies would happily replace any chips that were damaged in this way. If so, that's a very reasonable attitude, but I am sure

VLSI could not be held legally liable if it was discovered that you had been running the chips at, say, 30% faster than specification. CJE also say that they have run ARM3's at 36MHz and none of them get hot, let alone over-heat, though some cause the screen to lock up. Also, the ARM3 chips are rated to be able to run at 80°C.)

Secondly, I would like to know how you would decide what speed booster to buy. If you got one that was too fast, your ARM3 just won't function properly and if you got one that was too slow, you would not be getting full value for money. If CJE were prepared to allow you to try two or three and send back the ones you didn't want, that would be fine. I suggest you ask them before embarking on this one.

Thirdly, is it worth the risk? (No pun intended!) From some figures which Aleph One gave us when they first started producing ARM3's, an increase in clock speed from 30 to 34 MHz (13%) would only increase the overall speed of the computer by about 4% and even if you managed to push the speed up as far as 40MHz, it would still only give you about 15% increase in overall speed.

The ARM3 upgrade itself seems fine. It is well made and has the removable ARM3 chip. We are quite happy to sell it through Archive and it works out about the same price as the Aleph One ARM3 upgrade but we won't be stocking the Super Boosters!

• **Beebug A3000 Disc Buffer** — it has a couple of snags. One mentioned in the manual is that switching off the computer with the drives still powered can result in corrupted discs (even if ‘write protect’ tabs are stuck on); they blame this on the computer's power supply but it is like a great leap backwards to the very early disc drives. Secondly, trying to access 40 track discs (DFS or PC) without first switching the drive to double stepping can again result in corruption of discs. Finally, if the external drives are left connected, but unpowered, the internal drive becomes unreliable and may result in disc corruption during read attempts. Keith Raven

• **Digitised images** — I got some pictures digitised for inclusion in DTP by Betula Image Services, Flegg Green, Wreham, King's Lynn PE33 9BA. Drop them a cheque or P.O. for £2 if you want information about their service and a demo disc. Fred Stocker, Bexley.



• **First Word Plus Column** – Please keep the First Word Plus Column going, says Max Solomon of Shawforth, Rochdale. Indeed, he might even be prepared to do the work of keeping it going himself, especially if someone else were prepared to give him a hand. Any offers? Ed.

• **Non U.K. subscribers** may be interested to know how many other subscribers there are in their own countries, so here is the league table in reverse order:

Netherlands	90	Austria	4
Germany	51	Canada	3
Italy	32	United Arab Emirates	2
New Zealand	30	Sultanate of Oman	2
Australia	27	Luxembourg	2
Belgium	25	Finland	2
Norway	15	Zimbabwe	1
France	13	West Indies	1
Denmark	9	State of Qatar	1
Switzerland	7	Spain	1
Greece	6	North Borneo	1
Sweden	5	Malta G C	1
South Africa	5	Lesotho	1
USA	4	Japan	1
Singapore	4	Israel	1
Saudi Arabia	4	Iceland	1
Portugal	4	Gibraltar	1
Ireland	4	Cyprus	1
Hong Kong	4	Brunei	1

• **Old BBC Micros** – When I bought my A3000, I did not dispose of my BBC B since the value of early ones is fairly low now and also there was some software I wanted to keep running. So it sits on the desk alongside the A3000 with a monochrome monitor. Since it is there and connected to its big brother via a serial link, I wondered what use it could be as an adjunct to the Archimedes. A moment's thought led to the conclusion that its CPU power and its memory are negligible beside the Archimedes. However, there are some possible uses. Two-person games are an obvious possibility. Or it could be used as a driver for a second screen for an application running on the Archimedes. Two-monitor options are quite common on graphics programs for the IBM PC, with the "picture" on one and user instructions on the other. Not so necessary on the Archimedes, of course, since multiple windows can always be used,

but it could be a nice facility for e.g. a full-screen art program.

There are a number of possible ways to display on the BBC screen:

- send the screen control codes and have them routed direct to the screen at the BBC end;
- send coded information which a small program, running on the BBC, interprets and then modifies the display as appropriate;
- the ultimate would be a module which would intercept output intended for a Wimp window and redirect it to the BBC, but I suspect that is rather difficult.

It is easy to do a simple demonstration of option (a). Take a BASIC program on the Archimedes (not multitasking and no screen modes above 7) and add \*FX8,7 and \*FX3,5 at the beginning and \*FX3,4 at the end. On the BBC type:

```
*FX7,7 <return> OSCLI("FX2,1"):REPEAT VDU
GET:UNTIL FALSE <return>. Then run the
program on the Archimedes. All the output from the
program also appears on the BBC screen, including
graphics and mode changes! Unfortunately, this
simple approach is not much practical use; the BBC
receives the same bytes as the Archimedes' screen,
so they always display the same. You cannot use it
to get graphics from a program running in an !Edit
task window, for example. But this shows the
principle.
```

So to writers of Shareware programs: if your program makes a lot of use of the screen space, how about adding the option to use a second screen? It could be interesting. Jonathan Puttock, Wassenaar, Holland.

• **Ovation** – Adrian Calcraft from Beebug writes: I must say that I am astounded by the letter from Simon Burrows in the September issue of Archive. He wrote to us in July and said "I approve of you using software protection to protect against piracy... as long as it never goes wrong making the master copy unusable...". Our reply to Simon stated that if customers found that their discs had been corrupted we would always replace the discs for them.

Simon stated that Ovation has lifted many of the features of Impression – this is totally untrue. The specification for Ovation was prepared long before Impression was ever shown.

With respect to the protection of Ovation, it is certainly a matter of preference as to whether a dongle or software protection is preferable. Indeed we have had a very positive response from schools who are concerned about dongles getting "lost". The installation procedure of ovation allows two additional working copies to be made not one as stated. Simon unfortunately received one of a small batch with only one install. If the user wishes to move Ovation from one machine to another, or change the directory in which it is installed, there is an un-install option keeping the two copies intact. Should the user encounter difficulties resulting in the inability to install, we will, of course, supply a replacement free of charge.

We are happy to accept fair criticism, but to make assumptions without checking the facts is somewhat unfair to say the least, especially as we had made our policy clear to him in our reply to his July letter. Adrian Calcraft, Beebug Ltd.

• **!Slideshow from 628 Software**—Eric Cook's enthusiastic review of !Slideshow was, I felt, UNDER-selling the product. Although it does not do much, what it does, it does easily, smoothly and professionally. It is user friendly and reasonably priced. To add to Eric's list of extra features I would like, how about selectable transition times, circular and elliptical transitions, a transitions editor and transitions to black/white or coloured software set screens. (*All for the same price?* Ed.) R. Follett, Berkshire.

• **Suggestions for articles**—Could someone look at some of the PD software that we are being bombarded with at the moment and tell us which is good and which not? E. Hollox, Holt (If anyone wants to review any of the Shareware and Careware, let me know before writing anything. Otherwise we may end up with several reviews of the same discs. Ed.)

There have been a number of people asking for hardware projects for the Archimedes. How about someone doing something on one of Atomwide's prototyping boards? If anyone is interested, we may be able to arrange some sort of sponsorship.

• **Superior Golf** — I heartily agreed with Simon Burrows review of Superior Golf (Archive 3.12 page 19). He did, however, miss one novel feature. Select a three-player game, play as normal, and when player three reaches the green, adjust the putting direction so that the ball will pass through the player's nice blue pullover! Mike Tillbrook.

• **The Data Store** — I bought a copy of !FontFX ages ago. Considering that it only cost £10, it's very good value for money. The Data Store sent me a free upgrade a while ago and when I wrote again recently asking for another upgrade, they were happy to do it for me despite the fact that my letter to them was surcharged because of insufficient postage. Now that's what I call good service! (I have since sent them some stamps to make up for the surcharge and the extra trouble I put them to.) Robert Christmas, Gosport. **A**

## Help!!!!

• **Arvis Digitiser** — Has anyone who owns a Video Electronics' Arvis digitiser written any routines to enhance Oscar? I am sure Arvis can do a lot more than the software allows. R Follett, Berkshire.

• **'Bad free space map' error on a hard disc** — It's always somebody else's hard disc that goes down isn't it, but not this time! Working for a company that supplies hard discs, we always advise our customers to invest in a tape streamer and to take regular backups just in case the worst happens.

This is all very well but what if this kind of thing happens to you and you don't have an up-to-date backup (or no backup at all) and there is data on the disc that you wish to recover. Well, as long as it's an error

with the data on the disc (caused by the computer writing duff data due to a machine crash, a power failure, etc.) and it is not a hardware fault on the drive, then it IS possible to 'fudge' the data on the disc to allow you to recover as much as possible before having to re-format the disc.

The problem with getting the error 'Bad free space map' is that FileCore won't allow you to catalogue the disc. There are two copies of the free space map kept on the hard disc (next to each other!) and if both these copies are corrupt then FileCore is unable to fix the error. What would have been more useful is if the disc would go 'disc read only' to allow you to get your valuable data off the disc.



However, all is not lost. Having had this problem happen to me (and not having a backup of about 10 Mbytes of the data), I decided to see if I could rebuild enough of the free space map to recover the data. Working from the BASIC program supplied by Acorn to format hard discs, I wrote a program that read the disc record, calculated the position of the free space map, read both copies of the maps, decoded them and repaired them in such a way that the check bytes were correct (although the integrity of the map data isn't guaranteed). This process took about ten hours of hard work but it was rewarded by the fact that afterwards I was able to recover all of the data from the disc (except for an application directory I was deleting, at the time when the A3000 I was using crashed).

Maybe, if there is a need, some clever bods could offer a 'Hard Disc Recovery' service. At the end of September, I will be able to help (if required) in the writing of a program that could recover duff discs (and maybe even be able to repair errors such as 'Bad free space map' and 'Broken directory', without the need to reformat). If you are interested, please get in touch via Archive. John 'Lofty' Wallace

- **Bestfit program please!** Does anyone have, or is anyone prepared to write, a program to put a best fit curve through a set of experimental data that is not either straight line or exponential? Barry Joyce, Norwich.

- **Chessbase 2.3** – Does anyone know if Chessbase 2.3 runs under the PC emulator? J Hutchinson, Carlisle.

- **HP PaintJet** – Has anyone got a RISC-OS driver for an HP PaintJet? John Woodhouse, Long Stratton.

- **Locoscript** – Has anyone had any success getting data from Locoscript on an Amstrad across onto an Archimedes? Alan Leighton, Middlesborough.

- **Non-linear techniques** – Is there any software for the Archimedes along the lines of Wolfram's 'Mathematica'? J Kraan, France. *(Has this got anything to do with all this stuff about "chaos" that I edited without understanding a word of it!? See page 26. Ed.)*

- **PC Graphics Data** – Does anyone know how I can convert various PC graphics formats to Archimedes, namely .PCX, .PIC, .IMG, .CGM, .GEM,

.CGR and .EPS files? I have !Translator and !Change-FSI but they don't seem to cope with these formats. Pete Sykes, 42 Southampton Street, Brighton BN2 2UT.

- **Shinwa-CP80** – Where can I get RISC-OS and First Word Plus printer drivers for a Shinwa CP-80? C Purvis, Warwick.

## Help offered

- **3D objects from plan and elevation** – The answer to Elwyn Morris' question in the Help!! column of the August issue is that to produce a 3D object from plan and elevation information you need a program which we (TAP Consortium) produce called "Tabs". This is a model maker where the output is normally a series of printed nets with tabs attached for you to make up a scale model. However, if you save the model without laying out the nets, it can be taken into Euclid using a 3D converter supplied by Ace Computing. Here it can be suitably rendered and have extra objects added before exporting to Mogul to produce the required animation. Apart from the minor irritation of requiring three bits of software to do the job, it does illustrate well the portability of data achieved with proper RISC-OS programming and is a good advertisement for the Acorn architecture.

- **Electronic Science Support Material** provides teaching support material to science teachers. The material includes scientific diagrams, pupil handouts and posters. It is stored and distributed on disc and is copyright free. There is no charge for the material but if you do want a copy then you are asked to provide formatted discs and a stamped addressed padded bag. At present there are three discs: 'The Ionising Properties of Radiation' (Draw and Impression files), 'Variables Affecting the Rate of Reaction Poster' (Draw file), and 'A Listing of Science and Technology Education Broadcasts' (System Delta Plus). The scheme is run by Nicholas Horn of Rosemary Musker High School, Croxton Road, Thetford, Norfolk IP24 3LH. He runs the scheme in his 'spare time' and with his own finances and so is looking for commercial sponsorship. Any offers of help would be welcome.

- **Hot Dry Rock Geothermal Energy Project** – The Camborne School of Mines have been researching

an alternative energy source which involves percolating water through natural cracks and fissures in the rocks, where it heats up and returns to the surface through a second borehole. Jim Markland has sent us a public domain disc with various files relating to this project. It has been compressed and put on to Shareware Disc 35.

*The following items of "Help Offered" will involve Archive staff in disc copying so if you take up any of the offers, perhaps you would send a charity donation with your blank formatted discs. Thank you.*

- **Astronomy Programs** - The astronomy programs on Shareware 10 have been revamped by Ivor Clarke. Along with various bug fixes, they now include both the BASIC V procedures and the handling routines. These programs accompany a book called 'Astronomy with your Personal Computer' by Peter Duffett-Smith. If you want a copy of the updated software, send your old Shareware 10 disc back to us.

- **Fine Art Degree Show** - We have had four discs sent to us from the Leicester Polytechnic School of

Arts containing the results of a project undertaken by Glen Burnett to investigate 'electronic space' i.e. using the monitor as a window to see the 'space' inside the computer. If you would like a copy of these discs you should send us **four** blank formatted discs.

- **PipeDream Cash Book** - A comprehensive budget and cash flow system (which requires at least 2Mb) along with a simple wagebook file has been produced using PipeDream. It was developed by Ron Percy as a result of new public sector accounting requirements recently forced on New Zealand state primary schools. If anyone would like a copy they should send us a blank formatted disc.

- **Stacks of Genesis** - We have had all sorts of Genesis stacks sent in to us. If you want a copy of any of the following, please send us a blank formatted disc.

All about Iron Gate Primary School  
Silk Screen Printing Tutorial  
Designer Crime (a primary school detective story) **A**

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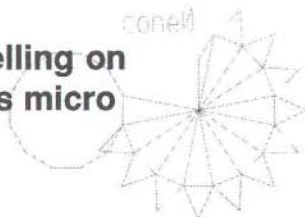




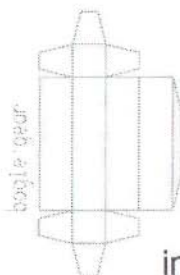
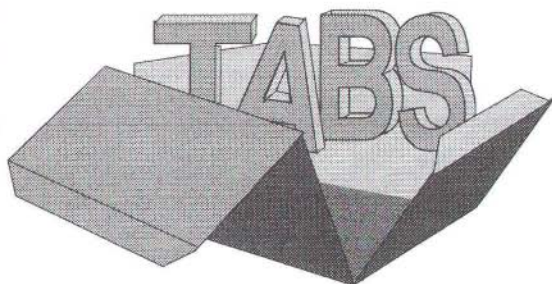
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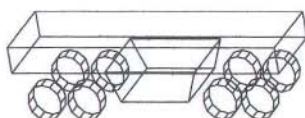
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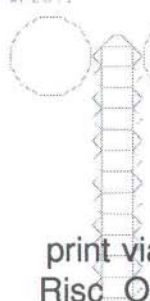
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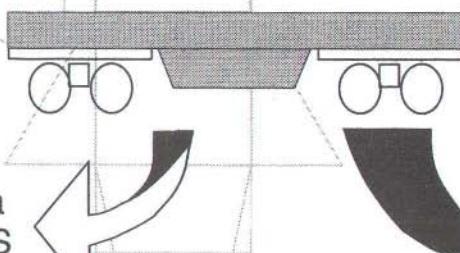
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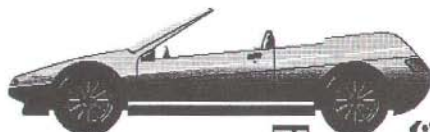
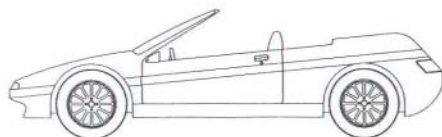
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!PenPlot	
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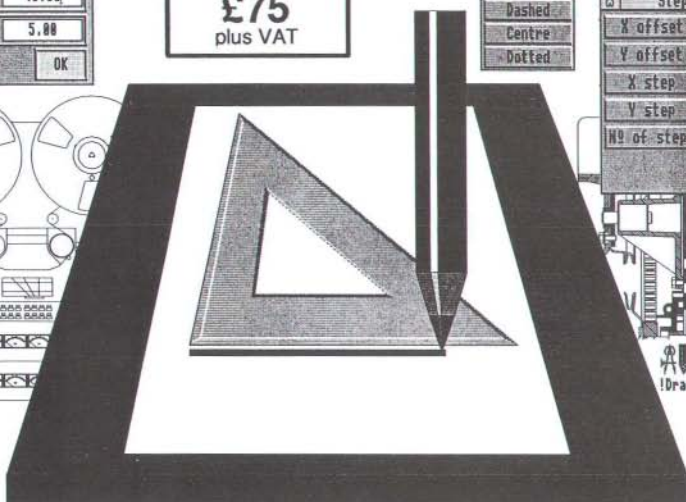


Step & Repeat	
X offset	10.00
Y offset	15.00
X step	10.00
Y step	15.00
No of steps	7
OK	

!Points	
!Absolute	
Intersection	
Mid-point	
End (E)	
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X	101.802
Y	3.38667
Layer	9
238	238 187



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multi-tasking CAD for Risc OS

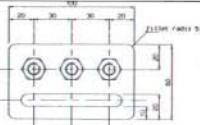


Grid	
Orthogonal	
Isometric	
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ENQUIRE: Select an object  
Line (81.280000,42.332520) - (118.913333,56.725854)  
Angle 25.906508 Layer 0 Colour R238 G238 B187  
Continuous

DXF	CO	OK
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!MorrCAD colour	
238	238
238	187
OK	



All WorraCAD drawings on this page were created on a 1Mb A3000

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# Hardware Column

## Brian Cowan

There were a number of interesting products to be seen at the recent BBC Acorn User Show. However, there were also quite a few interesting products conspicuous by their absence! I refer to Acorn's new version of the PC emulator which is still not quite finished. Also I thought that a Mac emulator might be making an appearance. This, also, did not manage to make it. Still, one lives in hope...

## New Archimedes

The most exciting thing to be seen was the new Archimedes 540 machine. I anticipated this when I reviewed the R200 series Unix machines in the July issue of Archive. As expected, the new Archimedes machine shares the same hardware as the R200 machines but with a different permutation of hardware options. The machine comes with a SCSI interface and a 100M hard disc drive. There is no ST506 interface built in, so that the ADFS is no longer used for the hard disc. It certainly makes good sense to have the Acorn SCSI filing system, since although there are other (possibly better) versions around, the fact remains that the Acorn implementation represents the standard. Also, having the SCSI interface already, other SCSI devices may be used directly.

## Features

Unlike the R200 machines, there is no Ethernet card included. (Now I understand why the R200 did not include Ethernet on the main circuit board.) I think this must indicate that Acorn are still committed to the Archimedes/non-Unix market. These machines have new video driver circuitry. I don't have the details of this but I understand that good high resolution colour can be obtained with much cheaper (PC-type) video monitors. Also, in these machines, the RAM is clocked faster. I understand that the speed is 12 MHz, but this might be increased in future. Details of the ARM3, RAM capacity/expansion, the floating point situation, are as for the R200 series, and I refer interested readers to my July article.

## Trinitron monitor

There is a new colour monitor from Taxan. This is

the Taxan 795 and it is the first one to use the Sony Trinitron tube. This tube was developed originally for colour televisions and it gives far superior performance. Instead of dots on the screen, there are rectangles. The phosphors thus fill the whole screen resulting in a much brighter, sharper picture. The cost is not significantly greater than the usual multi-sync monitors, so it is worthwhile considering this model if you are contemplating a monitor. I saw one being demonstrated by Martin Coulson of Atomwide. He was showing off his VIDC Enhancer and the quality of the pictures was quite superb.

*(Taxan 795's are available through Archive at £590 inc VAT & carriage compared with £520 for the Eizo 9060SZ. Ed.)*

## IDE hard discs

The rumoured new hard disc drive system from Ian Copestake Software (is that really Software?) was on show. He uses drives with the IDE interface. This is quite a clever idea because this interface is highly intelligent; the drive's circuit board does the hard work. So, connecting to the Archimedes is quite straightforward, simply requiring some buffers and a ROM for the filing system. Remember that this is a new filing system. Obviously it is written to look like ADFS, but there may well be difficulties in the early versions (remember the early non-Acorn SCSI filing systems?). Things like PC partitions do pretty strange things, so beware.

IBMPC-AT computers use IDE drives, which means that prices should be competitive because of the large market. In operation, the speed is faster than ST506 but I don't know if it is as fast as a comparable SCSI hard disc drive. Since the interface card is so small that it can be fitted into a 300 series machine without a backplane, it can slot directly into the backplane socket on the main board, and sit vertically. However in this position it is not supported as well as it could be. Of course, if you have a backplane, then it can be fitted in that. (See advert on page 14.)

## A3000 internal Winchesters

One exciting use for the IDE interface is the 2.5" hard disc unit for the A3000 machines. The drive

and the special IDE card for the A3000 are so small that they can be fitted inside the computer's case. I am sure this will make the A3000 machine more attractive for many people. However I do wonder whether the power supply of the A3000 is sufficient and, since there is no cooling fan, overheating may be a problem. The price of this unit is a bit high at the moment, but it should fall as the small drives become readily available with the expansion of the "laptop" market.

### Mac discs?

Last month I reviewed MultiFS from Arxe Systems Limited. This is implemented as a multi filing system supporting DOS, Atari and DFS formats at present, and there are plans to include other formats in future versions. This relates to a question which surfaces in this column from time to time, namely Mac discs. The standard answer is that special hardware is needed to read and write Mac discs, so you can't do it on the Archimedes. However, I recently learned that there is a product for the PC which enables Mac discs to be read and written. This is a hardware plus software product. You have to install a special circuit board between the computer and the disc drive, and load up the software. I understand that when installed, the board can remain in place and when using normal discs it appears transparent, coming alive when Mac discs are used. Arxe are hoping to develop a version of MultiFS which will support Mac discs, using this sort of hardware add-on, and I await this with keen anticipation. Other formats in the pipeline include the various non-Acorn DFS versions, Amiga and some CP/M standards.

### Software protection...

Regular readers will know that I am not very keen on software protection. My advice has always been to avoid protected software unless there is absolutely no alternative. I am particularly suspicious of software which is protected on the disc. There is always the worry that something will go wrong with the disc. I thought this had been the case with the game Alerion from Dabs Press. I had been given a copy of this and one day I discovered that it no longer worked. This was not terribly important as I am not wildly keen on such games. However I have

just discovered that the method of protection worked only with the old Arthur operating system. The failure of the disc coincided with the installation of RISC-OS on the machine. It is a sad thing when software has to be protected in such a way that it will not work on future operating systems of a computer. I realise that there is a problem with piracy, particularly with games software. But the other side of the coin is the mass of software which I have bought and which turns out to be perfectly useless and a complete waste of money.

### ...and de-protection

There are various programs around which facilitate the copying of protected software. Some are better than others but there are always new methods of protection devised which confound the established copying programs. The dedicated copier usually uses an Amiga computer, which has the special property that the disc drive is driven directly from the CPU – there is no disc controller chip. This is, of course, impossible on the Archimedes where the 1772 chip does all the disc "donkey work". The situation could change, however, when Arxe Systems bring out their Mac disc reading system. The hardware add-on would permit the disc drive to be told to do all sorts of unusual things and a determined programmer should be able to produce software to drive this board, permitting the duplication of any sort of disc.

### Dongles

If one must use protected software then I suppose the dongle is the preferred method. I have recently ordered myself a copy of Impression, so I will be able to see how it works out in practice. One further advantage is that if the software turns out to be useless (unlikely, I hope) then I believe that one can ask for one's money back. I am still convinced that unprotected software is the ideal, but if the result is that such programs are prohibitively expensive, then the choice is quite clear. I understand that comparable DTP packages for the Mac are very much more costly. I will report shortly on the practical aspects of dongles and how cumbersome they are in everyday use. I might even come up with a way of circumventing the difficulties! **A**



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# Language Column

## David Wild

Looking at the displays at the Acorn User Show and the advertisements in the recent magazines, it would seem that the Archimedes is really beginning to take off, with more and more programs becoming available. There are still gaps, however, and many of these can be filled by readers of this magazine.

We can't complain about a lack of tools; with two versions each of Pascal and 'C', three versions of 'Lisp', a couple of BASIC compilers and sundry other tools, we should be able to deliver the goods even if some of them, like ISO Pascal, are severely under-documented.

Our biggest task is to ensure that the software we produce, and the documentation for it, is of a sufficiently high standard to attract potential users who are not already committed to using the Archimedes. We all read magazines like *Archive* and *Risc User* in which we see the comments of other users but most of the potential market will never even have heard of these magazines, never mind read them. Our target audience has no interest in computers; to them the computer is a tool which is worth having if it will do the job properly without their needing to worry about it.

The biggest obvious gap is a programmable database. Programs like *Pipedream* can cope with some applications but tend to fall in usefulness as the amount of data gets bigger. If I were to start to specify an "ideal" database it would have the variable length records of *Viewstore* with improved versions of the input validation, indexing and report generation facilities of programs like *dBase*.

There can be no doubt that programs like *Ovation*, and even Acorn's own *Desk Top Publishing* program – in spite of all the rude things said about it, are way ahead of any similar PC program at the same sort of price. Where present programs fall down is often in very small things, such as the complaints on "SID" and *Prestel* recently about the difficulties involved in producing properly lined-up multi-column labels. (I have managed to do this using Acorn DTP but it took a lot more work than would be acceptable in a busy office.)

One other trend which I have noticed in recent months, right across the range of computing, is an

increasing interest in the craft of programming. This can only lead to an improvement in programming standards and will help to counteract the effect of commercial confidence on the discussion of programming techniques. Far too often, especially in relation to games programs, the skills needed to write good programs are confused with those needed to generate ideas for programs. Although both skills are often possessed by the same person there is no necessary connection between them, just as it is possible for someone to be a good seamstress but unable to design a new dress – as opposed to adapting an existing design to a new customer.

## Optimisation

I was very interested in the figures in Keith Marlow's article in the August issue of *Archive*. These showed the saving in execution time that can often be achieved by rewriting the program in a better way. Perhaps the most significant feature was that the major improvement came from using a better algorithm rather than anything related to the 'C' language itself. This, I think, is true of optimisation generally. There can be a great deal of difference between an algorithm that "works" and one that does the job as well as it can be done.

An important optimisation is the use of the binary search itself, rather than just going through the table until you find the entry you want. For a table of more than about 15 entries the use of even the inefficient version of binary search will produce savings which will justify the effort of sorting the table – and the efficient version will increase the benefits again.

Methods like the use of register variables have their place but not until you have got the main algorithm right. There is no point in "optimising" a method which isn't good enough anyway.

A question you need to ask is "Why do I want this part of the program to run faster?". If the answer is to give better service to the user, then the first action is to look at the algorithms. The only time actions like using register variables or rewriting part in machine code should be looked at first is when the need is to speed up a small section because of interaction with communications or interrupts.

At the same time, you shouldn't speed up a program by leaving out some of the parts that make it more

robust. Recently I needed to look at the conversion of rectangular to polar co-ordinates and so I looked at one of my books of Pascal programs to find a routine to do the job. When I looked at the program more closely, I found that it would produce a 'divide

by zero', or an 'invalid function' error if the 'x' co-ordinate was zero, and also assumed that all angles were in the first quadrant. Putting the extra programming in would slow the run down but would be absolutely essential in a program for distribution. **A**

## Order & Chaos

**Philip Wilson**

### Investigating non-linear systems using Archimedes Numerator

Numerator is a revolutionary "mathematical construction kit" programmed by Peter Hunter and published by Longman-Logotron. Numerator has far-reaching implications in the teaching and learning of mathematics in primary and secondary schools and, in creating it, Peter Hunter has discovered its usefulness in the pursuit of the most recent of scientific research worldwide, the theory of chaos. It is a tribute to the versatility and power of his software, that it can be so fundamental in its educational uses and yet so appropriate for state of the art research.

The Order and Chaos package comes as a 33-page workbook and a 3.5" floppy disk containing a collection of Archimedes' Numerator modules and workspaces, several colour plots saved as sprites and a textfile. You will need a copy of Numerator to run the software. If you are lucky, as I was, you might get a copy of James Gleick's "Chaos" to whet your appetite. (*I think that went out as a freebie with a certain number of the first packages produced. However, it should be available at "most good bookshops", say Longman-Logotron. Ed.*)

After two or three evenings discovering the new science so beautifully described by Gleick, I was eager to build some of these systems myself. With only a brief familiarity with Numerator, I decided to dispense with my usual technique of pressing buttons to see what happens and, instead, decided to follow the book! The introduction contains advice on increasing the Numerator graph buffer default value to accommodate a larger number of points when plotting the graphs. This proved to be rather tricky and really should have been described in more detail for a layman such as myself.

Each chapter in the workbook is simply a printout of the Numerator workspace relating to that topic, tog-

ether with examples of the many graphs which can be drawn from within Numerator. These graphs are only a small part of what is capable of being produced from the various systems defined in the workspaces. The suggestions at the end of each workspace offer a wealth of alternatives for further exploration. Having the example plots of such wonderful shapes as population growth bifurcations in the booklet is one thing, but watching them grow in real time on the screen is quite another! The delight is furthered by having the ability to zoom in on very interesting areas within each graph by altering the graph's x and y axis ranges exploiting one of Numerator's plotting features.

Population growth is investigated via Verhulst's equation

$$p_1 = (1 + r)p_0 - rp_0^2$$

where  $p_0$  is the current population,  $p_1$  is the population at the next time step and  $r$  is the growth rate. The work is extended by plotting population at previous time steps against current population. A second variation is achieved by introducing a steadily increasing growth rate  $r$  into the equation. This is simply done by incrementing  $r$  in the Numerator workspace. Chaotic behaviour occurs with fascinating consequences.

Michael Henon's work is represented by a system to plot his Attractor, a simple combination of folding and stretching. Again, zooming in on a part of the plot reveals what appear to be single lines but, on magnification, to be pairs, then pairs of pairs, etc.

Conventional mathematics is pursued in the form of a plot for damped harmonic motion using the formula

$$X = \exp^{act} \sin t$$

A variation is explored by plotting the difference between successive positions (as a measure of speed) against position, allowing a phase space map to be plotted out. The ease at which these variations can



occur and the speed at which the plots can be made, make this exploration very exciting indeed.

Fractal triangles are produced by using a pseudo-random number generator to choose one of the vertices of an equilateral triangle. A new point is plotted midway between the current point and the chosen vertex, and the process repeated. After 10,000 points are plotted, the true beauty of the fractal triangle can be appreciated and, by zooming in again, the reality of self-similar copies ad infinitum is clearly evident. If each triangle contains an infinity of holes, is there a pattern at all?

No glimpse at the study of chaos would be complete without an excursion into the world of Julia Sets and the Mandelbrot Set. To fully appreciate the enormity of the work, you really need to read the literature but what is developed within these remaining chapters is quite thought provoking. Both sets are derived from the simple non-linear equation

$$n \rightarrow n^2 + c, \text{ where } c \text{ is a constant}$$

Initialising  $n$  and  $c$  and iterating either  $n$  or  $c$  (or both) may cause  $n$  to tend towards some finite value, called an attractor. In other cases,  $n$  will approach infinity and be of no consequence. Plotting attractors along a number line will produce some one-dimensional patterns. Considering  $n$  and  $c$  as complex numbers allows the plotting of points with finite attractors in the complex plane. The non-linear equation becomes

$$x \rightarrow x^2 - y^2 + p \quad \text{where } n = x + iy$$

$$y \rightarrow 2xy + q \quad \text{and } c = p + iq$$

Julia Sets are produced when  $p$  and  $q$  are fixed and different starting values for  $x$  and  $y$  are tried. There is a different Julia Set for every combination of  $p$  and  $q$ . The Mandelbrot Set is produced by trying combinations of  $p$  and  $q$  and including those which produce finite attractors.

The colours on Mandelbrot pictures are achieved by noting the number of iterations required before realising the given point is not within the set. The workspaces allow you to experiment with the simple equation and build up your understanding gradually until you can fully appreciate the complexity of the points plotted. Because of the thousands of operations being performed by Numerator in plotting the points in the Mandelbrot Set, it takes several hours to get a

worthwhile picture. For this reason pre-worked pictures are supplied on a separate program, with full menu facility allowing you to change the scales and iteration size in the same way and save the pictures as sprites to be loaded into other applications for modifying and printing off.

Since the colours are achieved by noting the number of iterations required before realising the given point is not within the set, this allows a kind of contour map of "outsidedness" to be produced. If you have the patience to create the whole Mandelbrot Set within Numerator and even zoom in to witness the self similar copies, (altering the step size to increase accuracy over the "zoom" in area would require 2 or 3 days of running!) the sheer beauty of the plot makes it worthwhile.

Chaos may be best summarised, as it is in the package, by looking at the paths of a planet in 2D space as it is attracted by the gravities of two (and later four) stationary stars of variable mass. The idea that these paths can differ considerably with only the slightest changes in initial conditions is demonstrated quite superbly. In many cases the planet is "sucked in" by a star but, after only a slight adjustment from the starting conditions, a similar planet is given such an impetus on passing too close to a star that it is sent off into deep space. The ability within the workspaces to vary the star's mass and position, and the initial velocity of the planet make the combinations almost infinite, resulting in a series of wildly different and yet aesthetically beautiful plots. Eight initial settings are suggested, with the invitation to try as many further combinations as possible. The Newtonian equations used in the workspace modules are described in the workbook but the modules themselves remain the secret of the author!

I can certainly recommend Order and Chaos as a compliment to Numerator itself, both from the point of view of the sixth form mathematics teacher anxious to give access to students looking for exciting avenues to explore just outside their "A" level course, and from point of view of the layperson interested in the new scientific paradigm and how computers can help in its development.

Order and Chaos is £17.25 (+£2.50 p&p) from Longman-Logotron (£17 inclusive from Archive) and Numerator is £87.40 (£78 from Archive). **A**

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## Other features

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The manual includes a step-by-step introduction to Impression Junior. The tutorials take you, from scratch, through the creation of simple letters, multi-page documents and typical DTP type pages. The package also includes the highly acclaimed 'DTP at a glance' book.

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# DTP Column

## Ian Lynch

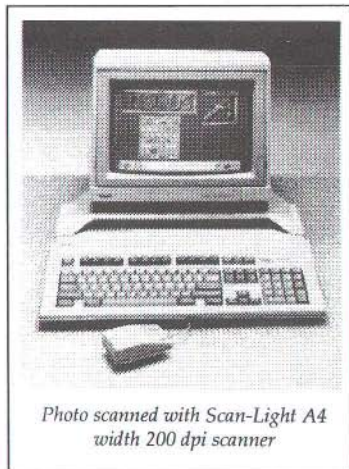
Last month I promised a review of Tempest but, talking to Dave Clare at the Acorn User Show, it appears that a much more complete version is soon to be available so I will postpone this for the time being. Once again, I appeal to anyone with any comments or views to write in. Tell me if you dislike the column, but tell me why so I can improve it. I would particularly like views if you have particular experience of features in one DTP which you find useful and are not available in others. After all, bells and whistles are only worth having if someone finds them useful.

## News

Acorn User was quite busy on Friday when I visited it. Ovation and Tempest were being demonstrated, as were Impression 2, Junior, Equasor and Laser Direct. The new 600 dpi version of Laser Direct is now up and running, and the half-toning for graphics is considerably improved with Computer Concepts working to get the optimum clarity on the screen as well as the page. I have enclosed a couple of images scanned at 200 dpi but printed at 300 x 300 and 300 x 600. I am not sure how much will be lost in reproducing them, but it should be possible to see the difference.

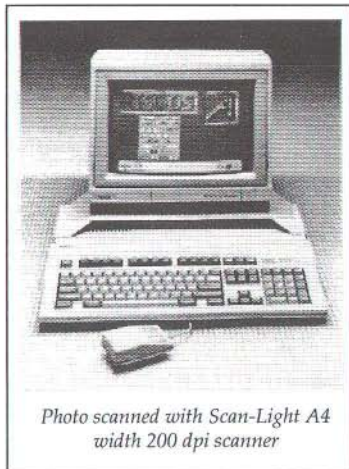
I had been told that at 600 dpi, the dots were the same size, just more precisely positioned, but Charles Moir of Computer Concepts says this is not so and looking at the pictures, the higher resolution sprites are a lot less grainy. A 4M machine is needed since 600 x 600 needs four times the memory. Technically, the printer should only be able to manage 300 dpi in the vertical direction but some clever software and hardware have enabled this limitation to be overcome. The system is complimented by a 400 dpi scanner and so the quality of prints should be getting towards the standards of decent monochrome photographs. (*More details of Laser Direct HiRes in the Products Available section, page 2. Ed.*)

Acorn's new A540 was being demonstrated by Roger Wilson. It will out-perform an ARM 3 upgraded A440 owing to its faster memory, and will provide an incredible DTP engine. I suppose the ultimate system is an A540 with Impression 2, Equasor, Poster, a 600 dpi laser direct printer, an Arvis video frame grabber and an Irlam colour scanner. This system would be under £10,000 even including a video camera, and could out perform any other micro on virtually any criteria you wished to use. I am intending to get an A540, so more about it soon. (*Unless you've got contacts, Ian, don't expect to get it too soon. See Comments on page 14. Ed.*)



*Photo scanned with Scan-Light A4  
width 200 dpi scanner*

Printed at 300 x 300 d.p.i.



*Photo scanned with Scan-Light A4  
width 200 dpi scanner*

Printed at 300 x 600 d.p.i.

Some of you may have seen "Johnny Ball Reveals All" on ITV on 14th September. The programme was about the print industry and an Archimedes 310 running Impression was one of the examples of modern technology. The students from my former place of employment at Kingshurst City Technology College were featured, having come second in an international newspaper production competition. They had in fact only been using the

software for a couple of weeks and were competing against children several years older who were using Mac's, BBC's and PC's. This indicates at the very least that RISC-OS software is easy to learn.

### **Value for money**

Simon Burrow's contribution last month was most welcome. I was interested in his view that Impression was over-priced. I have shown Impression to many PC and Mac users and they can't believe how cheap it is, particularly with the relatively small user base, and I am sure this will equally apply to Ovation and Tempest. Most comparable Mac software is well over £500 and the PC offerings are a lot less productive and still cost a lot more.

Now compared to BBC B software and some Archimedes' software, it is expensive but we must also take into account the increased sophistication and consequent increased development time. All the Archimedes' DTP's have taken longer to get ready than originally intended, which means all must have cost considerably more than the original budget. Perhaps some would consider Impression to be expensive compared to Ovation, but this depends on a comparison of features offered which, at this stage, is difficult since Impression 2 is imminent and Ovation still needs the odd finishing touch.

One comparison, however, is the way each was programmed - Impression in assembler and Ovation in C. It is likely that Impression would be more expensive to produce in this way, have more compact code/function and operate more quickly. However, programming skills, design and other factors, some of them subjective, also affect things. Having been fortunate enough to obtain a pre-release copy of Impression 2, I would guess that Impression 2 (and later enhancements) will provide the most sophisticated DTP tool on the Archimedes, but also the most expensive. Ovation, Tempest and Impression Junior will provide more than adequately for many users at lower cost. The user seems to benefit from a choice which can be related to needs and pocket, but if you try to get anything like the function of any of these on another machine, you will be forced to pay many times more.

What of Acorn DTP? Well I'm afraid that although it got the ball rolling, it just does not compete now.

Ask Acorn staff what they use. I'm not going to tell you but I hope Acorn are going to concentrate on multi-tasking comms, databases or some area where the need is greater rather than on up-grading in an already well-served market. I would like to see Computer Concepts, Clares or Beebug offering discounted trade-ins for ADTP. It could be a good marketing move.

### **DTP - a short history**

In order to give those new to DTP a firm base to work from, I have decided to start a series on the background to DTP and what it is all about, so here goes with the first instalment.

Wordprocessing has long been acknowledged as the most common activity performed on microcomputers, and probably still is. Wordprocessing heralded a revolution in the written word because hacks like myself who couldn't spell and had awful handwriting could suddenly communicate with our more literary counterparts and anyone else for that matter. The problem with early wordprocessors was that they were very limited in print style and needed very slow daisy wheel printers in order to give the standard of print that could be achieved on a typewriter. Putting text into columns or including pictures was impossible until only a few years ago.

### **Real printing**

Real printing required 'hot metal' or 'cold metal' technology. The Monotype method built text from individually assembled characters and Linotype from complete lines cast as a single unit. With cold metal, the characters were selected and placed in the compositors stick and eventually a metal frame called a chase. When this was complete, a whole page could be set.

There was an outcry in the print industry when computers were used to phototypeset. This involved using light to produce characters on photographic film under computer control, but early attempts were scorned for low quality and very inconvenient codes and procedures for changing typefaces (even worse than on today's PCs!). Even by the start of the 80's, a typeface would cost over £5,000, and though the operator could preview the finished page, he couldn't edit it, and it certainly wasn't WYSIWYG.



By the mid-eighties, the cost of a typeface had fallen by a factor of ten. Meanwhile, wordprocessing was improving with the likes of View and Wordwise superseded by Interword which offered many more sophisticated features such as on-screen underlining and bold. (Some PC wordprocessors still can't manage this and cost more than Impression.) Wordstar on PCs had become a standard but there were so many new wordprocessors that none could be described as truly universal and this is still the case today. Most were revised through several versions, adding extra features and becoming quite Heath Robinsonish in the process. Wordprocessors had to this point been limited to very few typefaces, and these were not shown on the screen. Graphics were either non-

existent or crude at the very best, and printers could only output limited character sets with any quality.

### Enter DTP

The desktop publisher was introduced as a separate entity, which might have text imported from a word processor or text editor so that a page could be designed as a unit mimicking the older typesetters. The BBC B had several crude DTP's which used screen dumps to provide rather low resolution images via a dot matrix printer and it wasn't until the advent of the page printer that serious DTP with good quality output became possible and this consequently revolutionised the software and display technology required to produce it. **A**

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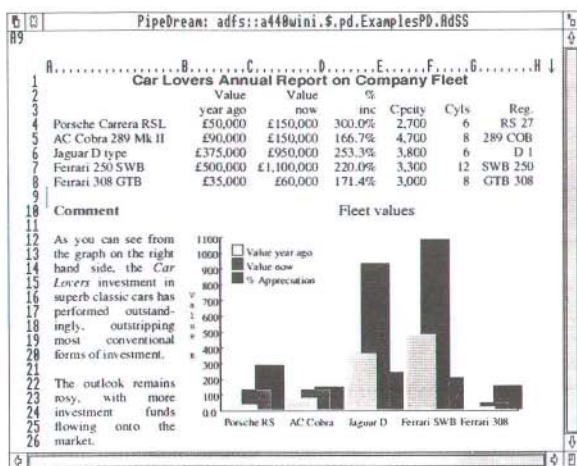
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# PipeLine

## Gerald Fitton

As a spreadsheet for the Archimedes, PipeDream is supreme. Although I see advance advertising for other spreadsheets such as Acorn's Schema (Clares have apparently taken over the marketing of Schema.) I have yet to be convinced that anyone who has used PipeDream will want to change. However, if there is a review copy available sometime then I'll let you know how these new spreadsheets compare with PipeDream. So, with spreadsheet applications in mind, the main feature of this month's column is about cell references, how they change when you insert new rows and columns or move a block, and the way that the replicate commands work. I shall follow this next month with notes on the use of the Index (column, row) function. Firstly though, there are a few 'matters arising' from earlier PipeLine articles.

### Linking files for home accounts

You may remember (or be able to look up) Stephen Gaynor's contribution under this heading in the July 1990 issue. In a footnote to that section I said "I have had another letter from Stephen saying that he has discovered that the Row and Col commands are Easier to Use". The problem Stephen had was that of addressing a cell where a direct reference such as B3 could not be used and the usual replication, which preserves row and column offsets, was inappropriate. Of course it would have been possible to have entered a reference into each cell individually but this would be tedious. There are many problems of this type including that of transposing a matrix (see use of Index(Column,Row) next month) and Stephen overcame the problem in a way he now believes to be a bit cumbersome. Now he has used Row and Col commands to simplify the problem and has reworked the same example. Disc files are available (see below).

As S. J. Haselton has pointed out, the command to write to a linking file is Write(n,column,row,value) may confuse some of you. The confusing bit is that the column must be entered as a number and not as a letter (e.g. use 3 and not C for the third column). All the arguments of the command Write must either be

numbers or must evaluate to a number (not a letter such as C).

### Relational database

In June 1990, I gave an example of using PipeDream for the administration of a tool hire club. Albert Kitchenside has added some refinements to it. There is now date stamping giving a visual reminder when a tool is overdue and a set of macros that take all the hard work out of remembering how to do it. He has also included a key strip generator that can be used with this application. Once again, disc files are available.

Also on this subject of Pipedream as a relational database, Stephen Gaynor has sent me a draft of the first article of a series which, with the worked examples, is of a size more suitable for the quarterly October 1990 PipeLine disc than for the Archive monthly disc (I think it's about 20 - 30kbytes without the worked examples). Stephen is working on the final version of the first article of the series but, even from the draft (July 1990), I can see that if you want to understand how to create a PipeDream database using relational principles you will benefit greatly from following this series.

### Lookup a date

Des Fry had a problem using Vlookup with a date as the key. What he wanted to do was find the closest value below if the exact date could not be found. If you look at page 315 of the PipeDream 3 User Guide, you will see that if the field is numeric then this is what happens - but it doesn't if the key field is a date. Des' solution is to create a numeric field:

$$(\text{year}(A6)) * 10000 + (\text{month}(A6)) * 100 + (\text{day}(A6))$$

where cell A6 contains the date field he wants to lookup. Then he uses this numeric field as the key field. Des has included a worked example (available on disc) which calculates both gas and electricity bills where the rate charged depends on the date.

### Cell references

A spreadsheet is rather like a large sheet of paper with a rectangular grid drawn on it. Each of the rectangles can be referred to by an address consisting of

the column (always a letter) and the row (a number) it is in. The cell at the top left of a spreadsheet is cell A1, the one below it A2 and the one to the right of A1 is B1.

Now let's go through a worked example. Start up a new sheet and set the File - Options - New cell format to numbers. Enter a number (e.g. 1) into cell A1, the formula  $\$A\$1$  in cell B2 and the formula A1 in cell C3. Next, change the number in cell A1 and all three cells will change. OK so far? Now start adding and inserting columns and rows. In particular you can insert a new row 2 and a new column B but, unless you delete a row or column containing one of your three entries, you will find that the two formulae change in a totally predictable way so that they always pick up the value from the cell which contains the number. The \$ does nothing at all under these circumstances.

Now get a bit more brave, mark a block and move it around (with <Shift>+<F1>). The formulae still change to refer correctly to the cell with the number in it.

Start again with 1 in A1,  $\$A\$1$  in B2 and A1 in C3. Mark the block B2C3 and replicate it into E2 (<Ctrl>+BRE) and you will find that in F3 you have the formula D1. This is because the offset (two up and two left from where you are) has been preserved. But look at the formula in E2 and you will see it is still  $\$A\$1$ . What has happened is that the \$ in front of the A has prevented the A changing.

Block copy works exactly the same way as block replicate except that replicate overwrites what is in the destination cells whereas copy repositions any filled cells by moving the content down those columns. To see what I mean, change the formula in F3 from D1 to F\$2, mark the same block, B2C3, position the cursor into F2 and <Ctrl>+BC (Block Copy). G3 contains E1 and F2 contains  $\$A\$1$ . You will see that the formula which was in F3 has moved down to cell F5 (two rows down to make room for the two rows you have copied) and now refers to F\$4 instead of F\$2 (again two down but the \$ has not frozen the 4).

To summarise, \$ only affects copy and the three replication commands. A file called Copying shows the final state of this sheet.

## Sorting ranges

Now we come to a more complicated example which uses sum(range) and avg(range). Start a new sheet and enter numbers into B2, B3, C2 and C3 (e.g. 1, 2, 3 and 4 respectively). Now enter the formula sum(A2D2) in the cell E2; no I haven't made a mistake including the two blank columns A and D in the range. Tap <F3> to mark the block, move down to cell E3 and tap <F3> again. <Ctrl>+BRD replicates the formula down through the cell updating the references as it goes. Notice that the 2's in the sum(range) change to 3's and that so far as sum(range) is concerned the blank cells count as a zero. So far so good. In cell B5, enter the formula avg(B1B4) once again I have included blank rows. Replicate this to the right. Let's see what you think goes in cell E5 (my formula is on disc - you'll get told the reasons why next month). Now mark the block A2E3 and sort it in descending and ascending order. If you did not have the blank rows then the sort would corrupt the averages of the columns. Change the range in B5 to avg(B2B3), replicate right, sort and see how the range in avg(range) is corrupted.

With the cursor in column C insert a new column. Place the cursor in (the new blank) C3 and insert a row. Fill in the empty cells B3, C3, D3, C2 and C4. Replicate the sum and average formulae again down the range F2F4 and across the range B6D6. You can insert columns (or rows) and then move blocks of columns (or rows) within the matrix. If you move a row outside the matrix (say below) then the values of that row are not included in the sum and avg formulae.

Try this: Replicate a row to outside the matrix. Let's call this your Master row. Change some of the values in this Master row and then Copy the Master row back to somewhere in the middle of the matrix. When you use Copy, the matrix automatically opens up (by creating a new blank row and moving everything below it down one row updating the avg(range) lower reference). A copy of your master row overwrites the blank row and the average is recalculated to include the extra row. Now do you see why I called it a Master row? Once you have a master row like this one (usually placed above the matrix to make it easy to find - you can also Fix this row if you want) you can enter new data to your heart's content, Copying into the middle of the



matrix after each entry. No! I'm not including the macros which will do the hard work after each entry but I'm sure one of you will come up with a super example I can quote in 'Matters Arising'. However, the disc file Matrix shows the final state of this example.

### Constants or variables

Mathematicians like to get rid of variables. A typical maths problem starts with 'Let  $x$  be...' and in the end, after eliminating lots of other variables, you find the value of  $x$  that makes all your equations true. Good computer programs on the other hand are full of variables. A good maxim for computer programs is 'Never use a Constant when you can use a Variable!' Here's an example of using a variable instead of a constant which also shows how \$ replication works.

The screendump shown in the diagram below is what you are trying to achieve. There are no prizes for guessing the variable. Most of what you have to do is self evident from the screendump but here's a couple of notes. Row 8 is the Master row as described

earlier, B14 contains  $\text{sum}(B9B13)$  to include the two blank rows so that you can sort the block B10D12 without corrupting the sum in row 14.

Now to the bit where you get to use a variable instead of a constant. The VAT rate is entered into cell C3 with the trailing character % (from the layout menu) and the number of decimal places set to 1 (for neatness). The cell C10 contains  $B10 * C\$3/100$  and is replicated down the column to cell C12. I know you could type C3 into every cell individually but, by using the \$, you can replicate down through a hundred cells if you wanted to. Suppose the VAT rate is changed (horror! is it going up to 17.5%?) instead of having to replicate a new formula down through column C you can change the value in cell C3 and the new invoice values and totals appear as if by magic.

Remember that you can move blocks around this sheet or sort the invoices (between the blank rows) with impunity. Give it a try. If any of you have a problem (or an extension of these ideas) then drop me a line (or better a disc).

PipeDream: adfs::PipeLinePB.\$,PL9010.CellRefs.VaryVat				
C10	B10*C\$3/100			
	A	B	C	D
VaryVat				
	VAT Rate	15.0%		
	Goods Value	VAT	Total	
Master	£0.00	£0.00	£0.00	
	£6.00	£0.90	£6.90	
	£7.00	£1.05	£8.05	
	£8.00	£1.20	£9.20	
Total	£21.00	£3.15	£24.15	

Here's a question for you to ponder on. What (self adjusting) range should you use for a vlookup function so that you can insert new rows or sort the existing rows without corrupting the lookup (i.e. the vlookup cell references update to the correct values automatically)? No prizes – but write to me and you might get an honourable mention.

### Customised functions

Next month I'll show you how to use the index function and dependent documents to export a matrix from one document, obtain its transpose in the dependent document and then import the transposed matrix back into the original document. You can use the principles of this technique to create your own customised functions in a dependent document just like DEFNAME(parameters) works in BASIC but generally "Easier to Use" (see July 1990 PipeLine Column) than BASIC particularly for non-programmers. How about a 'Dependent Document' Function Library? You really do need variables (or should I call them parameters) to make this sort of thing work.

### Disc copies of PipeLine files

Disc copies of all the files mentioned in this article (except Stephen Gaynor's relational database article)

are available from Norwich Computer Services by buying their monthly disc (£3). All the new files from Des Fry, Albert Kitchenside and Stephen Gaynor's Home Accounts update (plus the first of a series 'Spreadsheets from the Beginning', an everlasting calendar, a rates/poll tax database and much more) are on the (£5) October PipeLine disc available from Abacus Training at the address on the inside of the back cover. By the way, an annual subscription to the quarterly PipeLine discs, the four issues starting with the July 1990 disc, will cost you £18 from Abacus including UK postage (or £13 more if you've already bought the July 1990 disc).

### Contributions

Problems for the 'Help Wanted' section as well as contributions which show how to do something interesting or difficult will be most welcome. So, if you have a problem or an extended example, I would prefer it on a disc. That way you can save giving a complicated wordy explanation, there will be no doubt as to what you mean and, with your permission, I can make the problem and its solution, (or your extended example available to others on disc more easily than I could do otherwise. You can contact me at the Abacus Training address on the inside back cover of this issue. **A**

## Competition Corner

### Colin Singleton

I have never even set foot in a Bingo Hall but I have written software to generate the numbers to be printed on the tickets and to perform the calculations described below.

The selections of numbers printed on each of a series of tickets have to obey a bewildering collection of rules which, surprisingly, have no significant effect on the outcome of the game! We will therefore ignore them.

Bingo tickets come in a variety of shapes and sizes but the standard tickets used in the halls each contain fifteen different numbers selected from the range 1 to 90. The arrangement of the numbers on each ticket does not concern us here. For this purpose we will assume (incorrectly, in fact) that the fifteen numbers for each ticket are chosen at random, without reference to any other ticket.

Each player has one or more tickets and crosses off the numbers thereon as they are called by the Caller. The numbers are called in random order until someone completes a ticket.

It is possible, of course, for two or more tickets to be completed simultaneously, but the Managers do not like this because, like the pools companies, they prefer the publicity value of paying the whole jackpot to one player. They also like the game to be as short as possible, because they make their profits from the Bar rather than in the hall itself. In a good sized hall 55.6 numbers (on average) are called in each game and 86.6% of games result in a single winner. How many tickets are in play in each game to produce these statistics?

The average length of a game and the probability of a single winner, depend on the number of tickets in play. I would like you to write a program to calculate, depending on the number of tickets, the probability



that the game will end on the Nth number called and the probability of exactly W winners, for the necessary ranges of N and W. You should check that the N-list and the W-list each total one. Try the calculations for 10 100 1000 10000 100000 and 1000000 tickets and send me the six pairs of printed lists with the confirmation totals. (Yes, a million does happen and I have been asked to do that calculation.)

Accuracy of the probability values, especially for the less likely events, is more important than run

time. You should be able to tackle it without multi-length arithmetic but beware of the effects of very large and very small numbers.

Entries and comments please either via Paul at NCS, or to me at 41 St Quentin Drive, Sheffield S17 4PN.

The time has come to close the June competition (cities wordsquare). Winners next month. The July (grid circles), August (number circles) and September (prime numbers) competitions are still open, so there is plenty to work at. **A**

## Matters Arising

• **Computerware Ltd** – Some readers may be concerned about what has happened to them. Basically, Computerware is currently in liquidation. Customers who have ordered and paid for goods from Computerware but have not had them delivered should contact Norwich Computer Services in the first instance who will try to assist. Most product guarantees will be honoured by another Norwich company called Avie Electronics (0603-416863, fax 788640). This however does NOT apply to hard drives. "Computerware" RAM boards are now available from N.C.S. and P.R.E.S.N.B. *All Computerware queries MUST be made BEFORE October 20th.*

• **Investigator** – In response to Sean Kelly's comments last month: True, re-configuration could be improved but why should such a program be expected to copy itself? It has copied all the games and other software I have tried. The documentation is clear and simply laid out. You may also be interested to know that this is the only bit of Archimedes software that can NOT be copied on an Amiga using any of their fancy copying programs. R. W. A. Brumwell, Amersham.

I have managed to back up one or two Archimedes discs with Investigator but I find it useful mainly for backing up Atari discs of funny format, such as those with special formatting for reading on single or double sided drives. If I had been using it solely for Archimedes, I would have found it less useful. Alan Bennetts, Leicester.

One other reader said he had bought Investigator hoping to make security copies of some protected software because, in a school environment, it is never a good idea to give original (and only) copies

of software to children (or staff for that matter). Unfortunately there were a number of programs, such as Logotron Logo, which it would not copy.

A fourth reader also commented that there were a number of programs in common use which Investigator would not copy.

• **RISC-OS 3** – Acorn have asked me to say that following my mention in the July Archive magazine that I had been passed, anonymously, 'a disc copy of an early version of RISC-OS3', Acorn have informed me that no copies of any future version of RISC-OS have legitimately left their premises. RISC-OS 2.00 is the only released version. Final decisions about the contents of future operating systems have yet to be made.

As a result of receiving this information, I have destroyed the illicit copy I had been sent.

Acorn have asked me to remind readers that the unauthorised use of software is not only illegal but is also very damaging to the software industry as well as causing confusion and difficulties for users. Acorn will take a very hard line with anyone found to have unreleased Acorn software in his or her possession.

• **Subscription Confusion** – Quite a few subscribers who got a renewal notice with the last issue protested that their subscription was due to run to December 1990. This is actually not the case. The "3.12" that forms part of the subscription number on the sticky address label refers to Volume 3, issue 12, i.e. the September issue, not the 12th month of the year. Archive actually started in October 1987. (Doesn't time fly when you're having fun!) Ed. **A**

# Desktop Office – A First Look

## Tony Colombat

Minerva have recently released an integrated RISC-OS package which they see as being the "Mini Office" of the Archimedes. The package consists of a word-processor, database, spreadsheet, charts package and communications package. It contains a lot of facilities for £129.95 and what I have written here is only a first look at what it offers. I hope this will give people a bit of a feel for its capabilities. (*Any other comments from DTO users would be appreciated. Ed.*)

Certainly the package is integrated, with data being transferred easily through CSV files, or directly, as from database into a mailshot using the word-processor. The applications can be set up to start in favourite settings with the exception of printer codes.

Minerva, in their advertisement, claim that, "Desktop Office is all you need for Education, Small Business or Home use". This seems an exaggerated claim as, having used the package to test its potential in an R.S.A. "Computer Literacy and Information Technology" exam, I found a number of short comings.

## Word-processor

The word-processor is a Wordwise clone, being only just better than Edit and providing a rough WYSIWYG. Embedded commands are used to format or style the text, and setting up styles can require the printer manual to be at hand. I am sure this type of word-processor has its supporters but it seems a retrograde step for a machine of the Archimedes' capabilities. Too much effort appears to have been given to special effects such as five ways to enter a date in the document, three ways to include a time and various ways to change the size of text on screen. It is a pity that the time was not spent in providing a spelling checker or word count.

## Database

The database is impressive, powerful and easy to use but has only one search facility which is the "includes" criteria, for all types of data, which I find extremely limiting.

## Spreadsheet

The spreadsheet is likewise very good but is limited in size to 32 columns by 64 rows and text cannot be wider than the cell width.

## Charts

The charts package only permits a maximum of 3 data sets and does not permit titles of the graph or its axes nor are values provided in the pie chart option. Parts of the graph can be highlighted but the final chart is saved as a memory hungry sprite and printed through Paint (where titles can be added). The chart cannot, however, be added to the word-processor or printed out as part of the word-processor file.

## Comms

Unfortunately, I do not own a modem, so I could not try out the Communications application. (*We are hoping someone else will look at that for us. Ed.*)

## Overall

The package comes on an unprotected disc with a comprehensive manual and data files for a tutorial section. The manual has a reference section on each application and notes on integrating data between the packages.

I have written to Minerva highlighting the weaknesses and I will pass on their response but users are advised to check very carefully whether Desk Top Office can actually "meet all their requirements".

## Stop Press!

I met a representative from Minerva at a recent Acorn Roadshow and am pleased to report that criticisms about Desk Top Office, from various different sources, are being taken to heart and have resulted in a number of important improvements:

The database will now have the full range of search facilities including: ">", "<", "=" and "<>". There will also be an easier "AND" and "OR" facility.

The maximum spreadsheet size is vastly increased and will have extra functions including an "Average".

The charts package will permit titles for the whole graph and for axes and values will be available as percentages or data for the pie charts.

The wordprocessor is likely to remain based around the Wordwise embedded command system but I hope that a few extra features might be forthcoming like being able to add values to embedded commands from the menus.

No date was given for when the new version would be available. **A**



## New prices for A305 & A310 memory upgrades

### 2Mb - £325 incl. VAT

Prices include VAT, collection of your machine, fitting and testing of the upgrade, and delivery back to you. Fully guaranteed for 12 months.

- ★ **ARM3 compatible**
- ★ **Uses MEMC or MEMC1a**
- ★ **Available in 2Mb or 4Mb form**
- ★ **2Mb version may be upgraded to 4Mb later**

No software or hardware compatibility problems. The machine will automatically detect and make use of the extra RAM.

### 4Mb - £499 incl. VAT

#### Fitting

Installation requires component level experience, and IFEL provide this service if required. A computer collected from you on Monday is normally returned the following Wednesday. Ring (0752) 847286 to book your upgrade.

#### Further information

This board is also available on a DIY installation basis at a reduced price, provided you have sent for our data sheet on this product. This also covers the use of larger OS ROMs. Ring (0752) 847286 for a free copy.

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**2Mb RAM      £79 inc VAT**  
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Both versions use the same basic circuit board, and need just eight chips. This ensures that the load placed on the A3000's power supply is kept to a minimum.

For those wishing to supply their own RAMs, the board may be obtained with sockets fitted, but no memory chips.

**Bare board      £29 inc VAT**

Suitable devices are 8 off 514256 for the 2Mb upgrade (as used in the 400/1 series), or 8 off 514400 for the 4Mb version. ZIP package, not DIL.

**\*The cost of RAM is constantly varying, so phone for the latest price.**

### General

RAM for 400/1 series	£58/Mbyte
ARM3 30MHz	£510
45M SCSI drive incl. card	£535
4-slot backplane+fan	£66
MEMC1a	£59
Programmer's Ref. Manual	£74
Impression (limited stocks)	£135

Prices include VAT. A free price list is available.

### A310 RAM discount

Users of our 4-slot backplane may claim a discount of £5 off the above prices of A310 memory upgrades. Due to changing RAM costs, it is worth a phone call to check on the latest prices.

**Ordering details.** All prices include VAT. Payment by Access, Visa or cheque with order. Official and overseas orders welcome.



IFEL, 36 Upland Drive, Derriford, Plymouth PL6 6BD. (0752) 847286



# Redshift from Minerva

## Dave Sillett

Redshift, from Minerva, is a simple, easy to play but difficult to master game. The game is loaded from the desktop by a double click on the !RedShift icon. Minerva do recommend that you press <ctrl-break> before loading.

The story goes that it is the year 2240 and the evil forces of the seventh colony have gained control over the eight worlds of the solarian constellation. You have been given the task of single-handedly recapturing each of these worlds by destroying its surface, machinery and organic structures. Unfortunately, the seventh colony has also manufactured various small fighter craft to hinder your mission and destroy your ship by firing small homing bombs at you.

Your ship, "The Redshift 15A" (hence the name of the game) must be piloted around various tall structures such as fences, skyscrapers and craters. Impact with any of these results in your instant demise – fortunately the solarian chief council have seen fit to equip you with two spare ships. To help you, the ship is equipped with a "holomap terrain scanner" which details the things to blow up in yellow and the things to avoid in red. As you progress across the surface destroying the planet, a

small picture of the world in the bottom right hand corner gets progressively more blown up until eventually it becomes a fireball. When this happens you have cleared enough of the surface and it is time to make haste back to your hangar which is the entry point to the next level. There is also the possibility of a challenge stage between levels if you wish to try for it.

The surface of each planet is apparently cylindrical which means that you can fly either up or down the screen, changing direction whenever you need to.

My first impression was that I had seen it all before and there was nothing new about this program that was not already in dozens of other games. Soon, however, the addictive qualities of the game came through, resulting in the "just one more game" syndrome, which will be familiar to many people. My main criticisms concerning the game are the inability to redefine the keys and to jump levels by password or other means.

### Value for money ???

Well, on reflection, I feel that, even at the Archive price of £17, it is slightly over-priced for this type of rather un-original game. Under £15 would be a much more reasonable price. **A**

# PenDown Again

## Doug Weller

I'd like to add a few comments to Dave Morrell's review of Pendown. I've used both the test version and the pre-release version still being sold at the moment (September) for £39. This is still not the finished version and is missing some important facilities. Those purchasing the pre-release version will get a free upgrade to the final version – the price of this will presumably be more, but I don't know the final price.

The final version will contain both a dictionary and a spelling checker, with secondary and primary versions being provided. It will also allow the importation of graphics, although it specifically does not claim to be a DTP package. The addition of

a vertical ruler will make using graphics easier than in, say First Word Plus.

These enhancements will obviously increase the size of Pendown, but the pre-release version only takes up 80k, which I find extremely impressive for such a versatile package! This is because it is written in handcrafted assembler and of course means it can be used alongside !Draw or even Artisan II.

In addition to the normal editing facilities of delete and move block, it also has a very clever clipboard, called a bin. This bin can be opened and text deleted or copied to it examined and then placed anywhere in the document. Not only that, but the bin can hold several (sorry, haven't tested this to the limit!) different deleted or moved blocks, any one of which can be selected for pasting.



The Search and Replace facility has an option I wish Impression had, which is a count option. This lets you count repetition of letters, words, or phrases, which seems very useful in education. An undocumented feature (in the manual, though there is a text file on the disc) is the ability to use and assign function keys to any of Pendown's functions.

As well as the fonts Dave mentioned (Trinity, Relief, Jumbo, and Lineout) there will be (I am told) two more, including Gothic.

The version I have is still bugged. I think, however, that the bug Dave mentions that leaves odd bits on the screen, may be a RISC-OS bug, as I've seen it in most WP's and redrawing the screen always clears it. Any comments on this from someone more knowledgeable about RISC-OS?

Pendown is not copy protected but copyright rules and Logotron's licence mean that only one backup can be made, and it cannot be used on more than one computer simultaneously. Site licenses are available,

and Hampshire has already bought it for 250 or more of its primary schools.

Finally, the pre-release version comes with a really excellent 64 page manual. This includes two very good articles on wordprocessing for children and very clear, illustrated instructions for backing up the program. The instructions for its use are clear and well illustrated. Instructions for use are on the right hand pages, and the left hand pages contain some excellent illustrations of children's use of the facilities described.

The other point to note about PenDown is that it is page oriented – you click an icon to go from page to page rather than scrolling down.

I find this an excellent program. In fact, if you want to use outline fonts for word processing, want a spelling checker and the ability to import graphics but don't care about major DTP facilities, then Pendown looks like your best value for money package, not just for school but for any environment. **A**

## Preview of Rhapsody

### Jim & David Markland

Our interest in Archimedes' music hasn't surfaced much in recent months as a result of a considerable preoccupation with other matters. Our attention was, however, brought to the fore by Clares' advertisement for Rhapsody – a new, relatively modestly priced, music editor written by one J.O.Linton – which promises to fill some of the gaps left by Maestro.

Having obtained, through the kind courtesy of Clares, a pre-release demo disk, we have been able to explore this product a little. 'A little' because the demo has several limitations which, it is understood, will be removed in the final product.

The demo, unfortunately, would not load scores, had limited printout capability, several bugs and could not save files. Above all, it had no documentation. (We found, for example, that the keyboard could substitute for mouse menu selections – but weren't sure to what extent.)

Experimentation stopped when the third trial score was deleted by accident. (Hopefully the final version will have a pop-up warning which reduces the risk of this happening).

Our comments are, therefore, rather brief.

The most appealing features are the abilities to: copy blocks of data from one score to another, thus facilitating replication; transpose, thus facilitating the production of parts for different instruments or implementing key changes; print scores, by part or as a whole, and to drive a midi interface for input and output. Rhapsody will also perform a subset of operations on Maestro files.

The exciting thing about Rhapsody for us is that these were all in Jim's wish-list in a previous Archive article on Music on the Archimedes.

How well does it do them? Well it's difficult to say a great deal because of the above limitations of the demo. The demonstration scores are certainly very impressive. We did see an advertisement which implied that the package could be suitable for seven to eight year olds. This may be true but, if so, only to a limited extent, given that the junior author (David age 12, a grade 5/6 musician) came to a sticky end trying to explain some of the, apparently rather complete, musical notation set.

We do not know what will be provided in the way of written instruction but it is fair to say that we were

able to work out the basic features fairly quickly (most children don't read manuals anyway – but we didn't discover blocks easily). We are certainly left with some puzzles.

Trills look fascinating but their use and editing needs explaining. How do we use blocks properly? What, if anything, limits their use? Can we copy

data from one position of a stave to another position on the same stave? Why are the data files inside the application? Beats?

Rhapsody looks to be a very exciting package, offering most, if not all, of what we had ever imagined to be useful, and deserves lots of success. We look forward very much to seeing the real thing. **A**

## Small Ads

### *All A310's for sale here include RISC-OS:*

- **A310** + 4way Bplane + ext disc interface, £475. Phone 0407–831583 evenings.
- **A310** + 5.25" drive £500. Philips CM8833 £200. Full software selection. A C Otway 0706–215381.
- **A310 base** and 4 slot backplane £500. Contact Simon Williams on 0804–23396 (South Devon).
- **A310 colour**, IFEL 4-slot bp, Oak 45M SCSI drive + podule + lots of software, £1,000 o.n.o. Will consider splitting hardware. Richard on 0970–84201 (evenings).
- **A310 colour**, 2nd internal drive, manuals and software, £700. Epson FX80 £200. Two BBC drives (3.5" + 5.25") £35 each. Many BBC books half price. Graham Crow, 0600–6403.
- **A310 second floppy kit**, hardly used £65. Techsoft Designer Intro £30. Mike Gardner 081–864 4805.
- **A310M** + Colour monitor, fourslot backplane, PipeDream3 £700. Contact Jim Simmonds 0642–750707 (office) or 0287–51675 (home).
- **A310M** plus lots of software, boxed as new £500. Also 400 series ram at £50 per Mbyte and 3M DC600XTD data cartridges at £10 each. Ian Pomeroy 0245–325205 (home) or 0245–351515 (work).
- **Acorn DTP** (new) £90, Mewsoft Fancy Labels £15, Mewsoft Designers £15, WS2000 with lead £40, Edge stripper £5. Phone Ken on 0202–532216 (evenings, w/ends).
- **Acorn DTP** £70, System Delta Plus £40, U.I.M. £18, Artisan + Support Disc £20, Alphabase £25, Graphic Writer £14. Phone 0703–550262.
- **Art Nouveau** £25, Nevryon £12. Phone Jeremy Mears on 0242–521050.

• **Interdictor** £10, Fish £10, Holed Out £8, World Class Leaderboard £8, Zarch £8, U.I.M. £12. All o.n.o. Phone Glen on 0332–573167.

• **Software** – Apocalypse £20, Thundermonk £8, Repton 3 £8, Pacmania £8, Jinxter £12, Interdictor £20. Please send cheques (postage paid) to M Drayton, 38 Baunton, Cirencester GL7 7BB.

• **Watford 5.25" drive** and interface £50, CC backed ROM module with Interword and SpellMaster ROMs + 128k ram £75, Elektor sampler/IO port tested £60, Euclid + Mogul £40. Geoff Clout 0532–795144.

## Charity Sale

The following items have been donated by subscribers and are on sale in aid of charity:

- **Orion** £6; **Droom** £10; **Desktop Stories** £12; **GammaPlot** £20
- **MicroLink** modem – offers over £20
- 3.5" discs (some best quality, some bulk pack, most virtually unused) 50p each
- **Minerva Business Accounts** (Order processing plus Nominal, Purchase and Sales Ledgers) offers over £50 for all four.
- **A0** (yes, A0, i.e. 16 times the area of A4) Calcomp plotter, self tests OK but owner unable to get the Archimedes to talk to it via serial link, offers over £35 (buyer collects from Grendon Underwood, Bucks.)
- **HP Diablo 630** daisywheel printer offers over £25 (same problem and collection as A0 plotter)
- **BBC Micro** second processor plus Bitstick CAD system offers over £100.

*Please telephone us to put in an offer before sending any money.* **A**



# Ace Computing



**RISC OS Euclid** is the best multi-tasking 3D graphics and animation system for the Archimedes. It works like a 3D version of Draw, and now forms the centrepiece for a number of related products allowing the creation of complex animation sequences with the minimum of effort.



**Mogul** makes full use of **Euclid's** unique hierarchical data structure to generate films of 3D objects with articulated motion and simultaneous camera motion.

**Tween** produces films from Draw files. It uses techniques similar to **Mogul** and generates a film by



calculating intermediate frames from a set of key positions.

**Splice** allows you to edit films produced by **Mogul** or **Tween**. You can even produce hand-drawn cartoons by converting sprites from any source.

Support is provided for import and export of Sprites and Drawfiles. Films can be played by the **Projector** which comes free with **Euclid, Mogul, Splice and Tween**. Films and Euclid files can be used with Genesis.



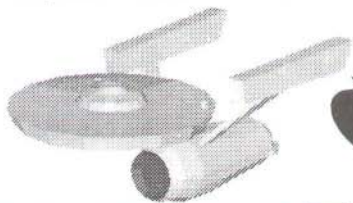
Such is the enthusiasm for **Euclid** there is now a user group called **Elements** which provides a quarterly disk containing hints, tips, animations and user pictures like the ones in this advertisement.

**Euclid** £70 **Mogul** £20 **Splice** £30  
**Tween** £30 **ArcLight** £50

Ace Computing, 27 Victoria Road,  
Cambridge, CB4 3BW.

Tel: (0223) 322559

All prices include VAT and P&P.



# Ace Computing

# Ivoryash Ltd's BBC Link

## Jonathan Puttock

BBC\_Files, the Ivoryash Multitasking Link, is a program for file transfer between Archimedes and BBC computers. Provided you have the necessary cable installed (and the optional serial interface, if you have an A3000), then to start the application, it is only necessary to type \*FX7,7 and \*FX2,1 on the BBC and then click on the application on the Archimedes in the usual way. About 20 seconds elapse while a program is sent to the BBC and then BBC\_Files installs itself on the left hand side of the icon bar as an extra drive labelled "BBC". Clicking on this opens a directory viewer for the disk in BBC drive 0. If the disk is a DFS disk then DFS (single-letter) directories, other than "\$", are shown as subdirectories; these can be examined by clicking on their icons. Certain file types are recognised from their load and execute addresses and translated to the appropriate Archimedes file types. The directory viewer shows large icons only, but lengths and load and execute addresses are available from an extra option on the menu.

## Transferring files

A file, or a selected group of files, can be copied from BBC disk to Archimedes disk, or vice versa, by dragging in the usual RISC-OS way. Files can, sometimes, also be dragged direct to an application. I managed this successfully with Edit and Pipedream 3, but BasicEdit would not accept the dragged file, even though BBC\_Files had displayed it as a BASIC file. Applications can also save files directly to the BBC disk. This worked well for me with Edit and Paint, but failed with Pipedream 3.

Clicking "Menu" on the BBC\_Files icon brings up the options of quitting, changing to a different BBC drive, or issuing a star command to the BBC. This last facility is very useful, since it allows control over what is happening at the BBC end. For example, a \*CAT will show the whole contents of a DFS disk on the BBC screen, rather than checking through each directory separately on the Archimedes.

## Multiple directories

I was impressed that the program could cope with multiple directories on Solidisk DFS. It is, however,

noisy as the program initially does a \*DIR for each of 59 possible DFS single-character directories. This results in the head scanning 59 times backwards and forwards across the disk reading the directories. It is possible that this extra load was the reason why my disk drive failed the second time I used BBC\_Files. I conclude that it is safer to copy first to single-directory disks, or to a RAMdisk if you have that facility.

## Bugs

There are a number of bugs in the program which are annoying since they could so easily be removed. The worst is that, if the program at the BBC end crashes, the BBC\_Files icon remains on the Archimedes icon bar. Trying to quit produces the message "Serial link is broken, restart application". So you reload BBC\_Files and find a second BBC drive on the icon bar. It is now possible to quit from one of these, but doing so closes down the program at the BBC end, still leaving one unquittable version running on the Archimedes. This is not serious because it is possible to kill the application from the Desktop Task Display window, as the instructions advise, but it is certainly untidy.

The recognition of file types is also unreliable. BASIC programs with an execute address of &8023 are recognised as such but those with &801F are not recognised. BBC ROMs are expected to have length &8000 but the ROM images can have lengths of &4000, &2000 and others. It might be better to look for the execute address of &DC9D, although I do not know whether that is universal. Another minor inconsistency is that, after a file is dragged to an application, it remains selected in the directory viewer.

Most of these problems, I would think, could be corrected by the authors of the program in about five minutes each. The programs are readable on the disk; they are in well-structured, well commented BASIC. It is to be hoped that Ivoryash will produce an improved version soon.

My comments relate to the Solidisk DFS, since that is what I have on my BBC, but I understand that the application should work as well for Acorn and



Watford DFS, and ADFS, since these are mentioned in the documentation. The documentation, by the way, consists of a ReadMe file on the disk of about 100 lines; but operation is obvious to anyone who knows RISC-OS, so that is adequate.

### Overall?

Overall, for the convenience it gives in file transfer

from the BBC, without needing to buy a self-powered disk drive and Archimedes interface, BBC\_Files is worth £9 despite the bugs. If and when Ivoryash tidy it up, then I would class it as highly recommended. I would, however, be wary about using it directly with multiple-directory DFS disks because of the stress on the disk drive. **A**

## SCSI Column

### Paul Beverley

• **A3000 SCSI podule** – We have now decided to stock the Lingenuity SCSI podules again. This is firstly because the A3000 podule is internal whereas the Oak podule, although it has the advantage of being a 16-bit podule, is external. Secondly, the Lingenuity A300/400 series podule has been added to our list again because it is now cheaper than the Oak equivalent at £185 compared with £220.

• **Removable Drives** – We have managed to get hold of some of the removable drives as sold for the Apple Mac. They are boxed as MicroNet MR45 and work beautifully on the Archimedes with the Oak SCSI podule. The capacity is approximately 42.3M formatted. (This MicroNet is a company in the States and is nothing to do with the U.K. 'Micronet', as far as I know.)

The price of the MicroNet drive (including cable) is £680 (inc VAT) on its own, i.e. assuming you already have a SCSI podule. If you buy it with a podule, it works out at £870 with an Oak A300/400 series podule or an Oak A3000 podule, £845 with a Lingenuity A300/400 series podule or £825 with a Lingenuity A3000 podule. The unit comes with one 42M cartridge and extra cartridges are £80 each.

Oak Computers have reduced the price of their 42M removable drives and so we can now sell them, with podule, for £995. Is it worth paying the extra £125 over the price Micronet MR45? (If you already have a SCSI podule and just want the drive then the difference in price is more: £680 as against £895.) Well, knowing Oak's reputation for reliability and good service, it may well be so. The company we are dealing with for the MicroNet drives is an unknown quantity to us. They have been very helpful so far but the acid test is how things work out if somebody has

trouble with one of the drives. How well supported will they be? We can only wait and see.

### Speed tests

The speed of different removable drives does seem to vary from cartridge to cartridge and from drive to drive with the same cartridge. Also, it does depend on the SCSI interface being used. With the Oak podules, the MR45's run at around 590 / 590 / 440 kbytes/second in modes 0, 15 and 21. The speed of the standard Oak SCSI 45M drives is slightly higher than the MR45's in modes 0 and 15 (655 kbytes/sec) but it is significantly slower in mode 21 (55 kbytes/sec). This may be because the MR45 has an 8k data buffer which helps to alleviate the memory bandwidth problems in higher graphics modes.

If you try the "better test" of copying the contents of Applications Disc 2 from one directory on the drive to another, the MR45 (with the Oak podule) compares very well with a straight 45M SCSI drive. Times in seconds are 9.3, 9.7 and 28.8 for the 45M SCSI as against 9.8, 9.8 and 11.4 for the MR45. So the raw data transfer rate of the 45M SCSI does not give any significant advantage when it comes to multiple file transfer. With the Lingenuity interface, the raw data rates are about 590, 430 and 280 kbytes/sec but the "better test" results are around 10.2s, 11.0s and 15.7s which are only 4%, 12% and 27% slower than the Oak interface respectively.

The Electric Scribe Company Ltd claim 650 kbytes/second for their 42M removable SCSI drives (see the advert last month, page 13). They are using the same SyQuest 555 drives as MicroNet but have implemented a proprietary change to get this speed increase. We haven't checked their claims but, in any case, the price is rather different. Their price of £861 inc VAT compares favourably with Oak's

£895 but is still rather high compared with the MR45's at £680.

### Software problems

At the moment, there are some slight problems with all the SCSI interfaces on removable drives. In the case of the Languinity interface, there is a problem which occurs with some removable drives and not others. The effect of it is that the drive, when copying files, takes about eight times as long as it should (80 seconds plus for the "better test"! ). Languinity are trying to see what is causing this, but in the mean

time, if you want an MR45 to use with an existing Languinity podule, please state that fact when you send in your order and we will ensure you get one that will work correctly.

The other problem we have had is with the Acorn SCSI podule. It seems to work on the raw data transfer rate test giving figures similar to the Oak interface. Unfortunately, as soon as you try to copy files, it gives up in disgust and won't copy a single file. We still haven't found out why it won't work so if you want a removable SCSI drive for an Acorn podule, ring us before ordering! **A**

## DFS Desktop Filers

### Brian Cowan

If you have any DFS discs from the old BBC days which you want to use, or simply transfer to the Archimedes, there are a number of products you can use. If you would like to have the convenience of the desktop, then there are three programs to be considered, although there may be others which I have not yet discovered. Last month, I reviewed MultiFS, which supports DOS and Atari as well as DFS, and in that issue Richard Ames gave a review of ArcDFS. So far no one has written a review of DFSreader, which was written by Emmet Spier and which is supplied on our Shareware disc 31.

### DFS readers

This is not really a review because I don't use DFS discs sufficiently to give these programs a really good workout but I have tried them to see what they are like. Most of my really old DFS programs were transferred over with the original transfer program from Philip Colmer, and then I used some of the Archive versions. These programs did not work in the desktop and they only read discs—they could not write DFS format discs and they certainly could not format them.

As I am now a real convert to the desktop, having become very lazy, I wanted a desktop DFS utility and now I am spoilt for choice. I tried all three out and my findings are summarized in the table below.

### Format

At the moment only ArcDFS will format DFS discs—in fact, it will also format in the non-Acorn DFS

formats as well. MultiFS certainly plans to format DFS and support non-Acorn formats in future versions, but this is not available as yet.

### File types

Only DFSreader supports file types, displaying the files with their correct icons. This feature is desirable both for convenience and because it looks nice. However, there is a more important reason as well. I use a BASIC to/from text utility so that I can write my BASIC programs with a plain text editor; I HATE the BASIC editor! Such a converter utility must know the type of file it is to work on, so support for file types is important.

### Drives and sides

With DFSreader, when you load in the program, you get one drive on the icon bar which you can then configure to the drive (and side) you want. Fresh versions of the program may be started for more DFS drives/sides. With the other two programs, when they are run, every drive in sight has its DFS counterpart and the icon bar can become filled with drive icons. MultiFS is clever in that the two sides of a disc appear as two "directories" of the single drive.

### DFS partitions


ArcDFS gives the facility for DFS partition on a hard disc, a RAM disc, or presumably on an ADFS floppy. This is very useful for DFS devotees, but most people should have converted to ADFS by this stage.

### Conclusion

Each product has its good points and its bad ones. It



depends on what you want to do and how much money you are prepared to part with. I hope the summary below will enable you to choose which one is for you.

	MultiFS	DFSreader	ArcDFS
From?	Arxe Systems	Archive	Dabs Press
Format discs?	no	no	yes
Non-Acorn formats?	no	no	40/80t: Acorn, Solidisk, Watford
File type icons?	no	yes	no
Nº of drives per instal'n?	all active drives	1	2 each floppy (1 each side) 1 each hard
Hard disc/RAM partition?	no	no	yes
Represent 2 sides as:	2 "directories"	separate "drives"	separate "drives"
Use from command line?	yes	no	yes
Price?	(£36) (inc DOS, Atari)	£3 Shareware 31	£28 (through Archive) 

## Arvis Video Genlock

### Ned Abell

A review of the Arvis Videocontroller/Genlock Expansion Card ARVC2/SVHS & ARPE9/SVHS encoder from Video Electronics Ltd.

There are quite a few applications in the video world where the Archimedes can be used to generate video images or where video signals can be passed through the Archimedes and computer generated effects superimposed on the incoming signal to create, for example, captions on the pictures.

Because of the complexity of the Archimedes' operating system, some very sophisticated effects are possible and it is also a very cost effective way of using an Archimedes as, for example, in my small business where the same computer also does the accounts and the correspondence as well as generating music tracks and captions and artwork for my S-VHS edit suite!

There are a variety of "genlock" cards that will allow you to work this magic and they usually start by decoding the PAL input video signal to RGB levels, mixing and locking the computer's RGB signals with the incoming decoded RGB and then converting

the whole lot back to PAL. The capability of the computer's colour commands can be used to alter that mix, setting colours or reducing them to make complex captions, effects and test signals. The Archimedes is becoming favoured in television production because of its speed and stunning graphics capability, as well as its low cost although the Amiga still has the largest market share.

At the moment there is quite a movement within professional video circles away from composite video systems where the information for both colour and brightness is carried down one video conductor to component video systems where these two signals are kept separate on two or more conductors. Advantages are better signal processing and storage, reducing cross colour effects where parts of pictures interact or strobe and also in reducing noise. More detail can be captured and pictures look clearer. It is an ideal complement for the Archimedes. There has been little component invasion of the domestic market as yet but be prepared for the onslaught of Super VHS from Panasonic and HiVideo 8 from Sony as products to replace your existing VHS or Video 8 formats.

Video Electronics Ltd are the first British company to produce an Archimedes' component decoder and encoder board in their Arvis range specifically for S-VHS. They have been making composite products for several years both for the Beeb and the Archimedes. The new product rides piggy back on an established video controller mother podule which fits in the Archimedes' backplane. The system has been well thought out because different types of encoder could be fitted to the same motherboard and, additionally, the system is expandable at extra cost with another backplane board called the videographics podule. The system is designed to fit into a 300 or 400 series computer.

I was advised by telephone of despatch and the unit arrived well-packed. The construction is of a high standard and the boards are individually soak-tested. The manual is 35 pages of plastic bound A4, well-written and with many diagrams of the boards and pre-set controls and it also details how to connect the board to the computer because, as well as plugging into the podule backplane, a connection must be made to plugs PL3A and PL3B on the computer motherboard. On many machines PL3B is missing (although Acorn are now fitting it) and so VEL supply one to be soldered in by the user! Yes, I too thought twice about this but the manual is very clear, showing diagrams of where the plug should be for both 300 and 400 series machines and the manual gives clear steps on going about the work. It took me 35 minutes of slow "checking and doing". I had to take the main board out and I would advise a very small needle pointed soldering iron and a solder sucker. Your computer dealer service centre should also be able to fit the plug if you are faint-hearted or want your computer to remain under warranty.

I use an IFEL 4-slot backplane and this provided a very rigid mount for the podule which occupies one slot and has a removable half width blank strip attached to fill the full width gap. VEL advise fitting the genlock card in slot 0 and then if you purchase the graphics card this goes in slot 1 and the blank strip is discarded. To complete the installation, a new lead is connected between the old monitor socket and the new podule and the original lead fitted from the new podule to the monitor. Connections are also made to external equipment—giving in my case S-VHS input from a camera or

player to produce live or recorded video and the podule output goes via an S-VHS mixer to the editing recorder.

There are some nice touches in the design of the product in that the S-VHS input and output connectors are wired in two ways and therefore will also give either composite PAL or S-VHS PAL input and output. There is a switch to provide input termination if you need it. A BNC to S-VHS DIN connector is also supplied. Internally the podule has two plugs inter-connected with red, green and blue wires to allow you to interrupt the signals with the graphics podule or even third party equipment and its also fitted with a phase switch and preset which allows you to change the phase of the output signal to match it with the input to, say, a vision mixer.

So the moment of truth was to switch on and there was the computer output on my external monitors. By using an external three way switch, the podule output will show just the Archimedes' display or allow the video input plus the Archimedes where the software supremacy key bits are set or, thirdly, a combination of shadow and normal key modes. This means that you can set a solid box within a video picture and display captions or logos within that box and also have a sort of teletext sub-title effect where the caption has an outline which reduces the contrast of the live video around it. VEL supply a disc of two demos and colour bars to show the various effects and this disc also contains programs to store \*Configure settings when removing the battery in the computer to fit the motherboard plug. I did feel that a little more software could have been supplied with perhaps some simple captioning utilities. However, VEL have been most helpful and even made up a couple of S-VHS leads for me as they had been in short supply from Panasonic. I returned my encoder board after a few weeks as there seemed to be some video level problems and this was returned aligned after calibration. I'm using an expanded 305 and it seems that some early computers need a field fix to bring the video voltages up a bit. Three extra resistors helped reduce the problem. Dealers have the information.

It is important to note that the display you get on monitors connected to the podule will not be quite as good as that on the computer monitor itself because,



at the least, you run an RGB monitor on the computer and this has a very high bandwidth, whilst the computer display on the outboard equipment will have been coded from RGB to PAL with a smaller bandwidth and will therefore not be able to carry as much information. In normal use, this is not a problem but some slight colour fringing is apparent on saturated colours with sharp verticals. As with many genlocks, the trick is to use de-saturated colour where possible to reduce the effects. Having said that, running the Clares graphics demo with the Newtons Cradle which has bold colours produced superb results.

This was one of the first boards delivered and it has been thought out and well engineered. VEL were at the Which Computer Show and demonstrated the S-VHS genlock and videographics modules together – a stunning system as the graphics framestore allows you to digitise incoming pictures into a high resolution sprites with up to 32000 colours. It is 384k byte by 16 bits store with a capture time of 1 field. An application demonstrated was of captions

from the Archimedes moving over a grabbed background which contained windows showing live video. That's the subject of another review when I can afford to buy one!

I rather jumped the gun and ordered before VEL had announced the product but the company were helpful and got me my board as soon as they could. I also got the impression that they wanted to provide a continuing range of products to Archimedes' owners and were therefore more concerned with reliability than volume sales. I like that sort of attitude and will use them again. The equipment is in the higher price range but has advantages over others in that you really get two types of encoder for your money, it is also expandable to the most impressive graphics system and the build quality and after sales service are of a high order. With supporting presentation software and the VEL system, the Archimedes should be a more than serious contender for the Amiga.

Price: £527 including VAT for the video controller and encoder. The videographics card is £877. **A**

## Public Key Cryptography

### George Foot

Archive readers may have noticed an article in BBC Acorn User for October 1990 (page 72) which discussed Public Key Cryptography and included a simple program for this purpose.

It may be timely to mention, therefore, that we (that is, my collaborator Dr Roger Sewell and I) have written four programs for public key cryptography on the Archimedes computer.

It is our intention to release some of these programs for the interest of Archimedes users. They will also have a very real practical value in enabling messages to be exchanged with an extremely high degree of security between any two people who have the need of privacy in their communications: for example, a lawyer with his client, designers discussing information on matters not yet patented, company representatives forwarding confidential business information and the like.

The principle of public key cryptography explained very simply is that two "keys" are generated by each individual, one of which (the public key) is published. Using this public key, anyone can create an encrypted

message which cannot be read by anyone else except the holder of the complementary private key which he takes care not to reveal.

The public keys are available in a Directory of Keys. The great advantage of this method is that any two persons can communicate with each other in secret without making any prior arrangements and without the need or the difficulty of transferring keys between each other in a secure fashion.

Our proposal is to publish a magazine to be called "The Public Key" which will be concerned solely with public key cryptography and will include programs for that purpose as well as a directory of public keys.

This activity is intended in the first place as a small scale hobby interest. It is not proposed to make any charge for the magazine at the present time. Later, a small charge to recover expenses may be necessary. Anyone interested is invited to write to me at the following address: Waterfall, Uvedale Road, Oxted, Surrey RH8 0EW. A date for the first issue of the magazine is not yet determined but it should be in the near future. **A**

# XAT Video Utilities

## Ned Abell

If you are seriously using video, this is an indispensable disc containing a selection of well written utilities. It also seems to be the only one on the Archimedes' market. Last year, I bought the first version (V1.00) from Archive and used it in my business a lot, so I rang the author, Paul Reuvers in Holland and suggested a couple of extensions.

The disc really contains two types of application, some for screen and mode control and others for providing high quality images. For computer control, the application !Video is loaded which provides a relocatable module "VideoUtils" giving the option of four new screen modes, new SWI calls and star commands. The modes available, 50 to 53 inclusive, are Acorn registered and can be accessed by \*MODE or by BASIC or a VDU22 command but only under RISC-OS. Being overscan modes, they allow the Archimedes screen to be enlarged to the same size as normal television pictures. They are:

O'scan mode	Colours	Graphics pixels	Text char x row	Memory used	Mode equiv
50	16	768x288	96x36	108k	12
51	256	768x288	96x36	216k	15
52	16	384x288	48x36	54k	9
53	256	384x288	48x36	108k	13

All new modes have screen co-ordinates of 1535 x 1151 and a screen ratio of 3:4.

The disc is supplied with a well printed, clearly presented, 22 page, spine-clipped A4 manual. The SWI calls from the module can be implemented in your programs or you can use "\*" commands to set the screen mode, generate an interlaced signal and change the size of the border. There are other calls to interrogate the state of the VIDC. More importantly, the call "Video\_SuperImpose" allows setting of the supremacy bits for colours to be either transparent or overlaid on any video signal so that if you have a genlock podule, you can provide sophisticated software control of Archimedes graphics over incoming video pictures. The module commands are brought together in an application called !XAT which provides icon bar menu control of these calls and thus you can set interlace or superimpose on and

choose which colours to use, simply with a few mouse clicks. There is also an option to save your settings to disc and this is very useful.

Using the !Video application then opens the choice of other video utilities. !TVClock generates a full screen realtime clock which can be overlaid on the incoming video, or not, depending on the mouse button pressed. It can also contain a caption in anti-aliased fonts, whilst !VTRClock provides a video tape header clock with adjustable pre-set run times and cut to black times, as well as 5 lines of header information such as the programme name, client and format. There are sound cues at the run points and cut to black times. Again these settings and texts can be saved to disc.

## Video titling

To title your videos, a basic horizontal roller is used which accepts text from !Edit in different fonts and runs it at 32 pre-set speeds across the bottom of the screen. Two colours can be used and the colours are alternated by use of an identifier symbol in the text which is simply dragged into the application and then speed settings, fonts, etc are selectable. Sprite-size must be set to a suitable level – annoyingly there is no program prompt. When this application was written, it seems a vertical scroll was intended but this is not implemented. This is one area of the package that could be extended but the semi-professional and audio-visual market at which it is aimed would probably use other more comprehensive software for titling.

XAT do listen to constructive criticism and the package will be changed to incorporate customers' feedback e.g. my suggestions. This version (1.00) gives a couple of applications for a screen test card and colour bar generator. The colour bar generator gives 75% EBU bars and the test card gives a range of grey scales, patterns and colours for alignment. However these have now been re-written by Paul Reuvers as a stand-alone Video Pattern Generator application which is very impressive and will be implemented on a future version.

If you are involved in broadcast television, field service or any application using monitors, video recorders or where video goes from A to B then you




will need this. Essentially, the new menu gives a choice of solid screens in either grey, white or red and bars to EBU 75% colour level or in grey or green. There are black and white test screens of pluge, multi frequency and 250kHz bars as well as shapes such as circle, grille or cross to check alignment. There are also three other screens giving a full test card, one called 20T2T – a form of pulse and bar, as well as a user screen which was not implemented in my demo copy. I have one to put here called camera bars which generates a thin colour bar strip in the picture cut-off area.

Text can be selected over the screens, the overlay can be switched off and on (as can interlace) and the screens can be set to normal size or overscan. There are also a group of three Halfbar screens which generate red patch EBU bars for video headers, blue

patch for sending to line and half height bars so that if you have incoming bars, you can quickly match the two signals. Again text can be added allowing simple identification of outgoing video in transmission systems. I have just bought a vision mixer and was able to do some quite complicated line-ups with the aid of this disc and an oscilloscope.

XAT have made a very good job of this package and these utilities are essential if you own an Archimedes connected in any way to good video equipment. The future enhancement of the package by the !pattern application will make it even better.

XAT Video Utilities distributed by Wild Vision  
£79.95 + VAT

X-Ample Technology, PO Box 77, 5340 AB Oss,  
Netherlands (010-31) +4120-34433 Fax 43884 

## Nevryon – Another Shoot-Em-Up

### Dave Bilsby

Nevryon, from 4th Dimension, comes on two discs with a rather small and unimpressive players' guide. Despite only being four pages long, it does cover all the necessary information for playing the game. Nevryon loads with <shift/break> (but it does require drive 0 to be configured as default). After a while, a title screen loads and the almost obligatory background music starts. However, unlike some other games, the music is very unintrusive when playing. Pressing a key quits the credits screen and loads the options page. This allows you to start the game at level one or change the program's settings.

The options menu allows you to change the volume level of both the music and the other sound effects, have the internal speaker on or off, change the default keys or set the level you want to start at. For some reason, the levels come in sets of two so you can only start at levels 1, 3, 5 or 7. For levels three onwards, you do of course need a password. Clicking on Start either prompts for a password or loads up a level menu. This gives a helpful hint on what armaments would be useful for that level and also gives you the option to QUIT at this stage.

### Game play

You play the game by controlling your ship around a continuously parallax scrolling right to left scene.

The idea of the game is to rid the planet Nevryon of the alien beings and save the deposits of titanium. In other words, you shoot everything in sight! Your ship comes, as standard, with a front mounted cannon. This you use to shoot the aliens which come in various shapes and forms. As you destroy the aliens, you release bonus pods of four types which increase your fire power. These pods, depending on the type, give you either extra primary or secondary weapons, extra shields or increased fire rate.

### Weaponry

The primary weapons (from red centered pods) fire with the standard cannon when added to your ship. With the first pod, you get twin forward firing missiles which float out from the sides of the your fighter and then ignite and shoot towards the target. The next two pods give you two gun droids which float close to your ship and fire rapidly forwards. The next two pods you get give you two beam lasers which fly above and below your ship.

The secondary weapons are more powerful but you can only have one at a time. You gain these by collecting the gold pods. The more pods you acquire, the better the weapon. When you have sufficient pods for a particular weapon, you can select it and cancel the previous one. The weapons available are a flamer which produces two big flames around the

ship which stop alien bullets and also damages their ships, mines which are released in threes out of the back of the ship and destroy any alien, beamups which are very powerful laser bolts which destroy most aliens in one shot, smart which destroys all aliens and scenery weapons on screen, Force which is a 10 second immunity shield and power which regenerates the power cells of your ship. The first three can be fired repeatedly when the energy bar is recharged, the last three however, are one off.

Extra shielding is obtained with blue pods and consist of first a ram affixed on the front of your ship. With two more pods, you get two shield orbs which float above and below the ship. All these can be fired off from the ship to help destroy the enemy or collect pods out of reach. Finally, there are blue speed ups which increase your rate of fire. After each set of two levels and when using up your two game credits, all

the primary weapons and shields you have collected are lost. Secondary weapons, however, are retained.

### Overall

All the graphics in Nevryon are big, colourful and very stunning and by far the best seen on the Archimedes so far. The stereo music and the other sound effects are also very impressive. The only gripe I have with it is that it cannot be transferred to a hard disc. This is because the game uses a SYS call to load several sectors directly off the floppy disc. This is their form of protection but if you are prepared to fiddle with the program, it is very easy to remove it and with a bit more work make it run off a hard disc. It hardly seems worth putting this sort of protection on the disc. It would be better to produce the software so that it can be transferred to a hard disc – to give those fortunate enough to have one the speed increase available. Apart from this, Nevryon is a very good game and recommended at £19.95. **A**

## Maps of the World

### Diane Hobson

The package contains two discs and a leaflet with a list of the maps contained on them and instructions on how to colour the maps if required.

The first disc contains: !Colour, !index-1, !Instruct, !Readme and 34 Maps in !Draw format and the second disc contains: !index-2, !World and 22 Maps.

The !Readme file tells you:

- a) how to get your automatic free upgrades by sending in a disc with a special !Edit file on. This is recommended because Micro Studios say the maps are regularly up-dated.
- b) how to load the maps into !Draw and un-group to separate the different parts and then edit them if required.
- c) that to load !Colour into !Draw you must first have !Fonts available (i.e. Doubleclick on !Fonts before selecting !Colours). However, if you have the Font Manager, the fonts will be loaded automatically, if seen.
- d) to send any additions or corrections to Micro Studio and that any useful ones may be rewarded!

The !Instruct file appears to be the same instructions as on the printed leaflet but without the diagrams

and !index files contain full lists of the maps on each disc though this is also listed on the leaflet.

The !Colour application gives an impressive demonstration of how the maps can be coloured and other effects added such as shadows or text boxes.

!World (on Disc 2) is a ready coloured map of the world continents. (An uncoloured version of the world map is also on this disc.)

### Using the maps

To use the maps, !Draw must of course be loaded (or have been previously seen on hard disc). The maps can be loaded into !Draw or any other program that recognises !Draw files. I tried both Impression and Genesis.

There are some 57 maps in all showing well over 100 countries. The maps all have black outlines, most have major towns or cities marked with red dots and some have blue lakes. None appear to have any rivers, which I would suggest could be a useful addition. A compass is shown pointing North which is the top of the screen for each map. A few of the maps show state boundaries, the U.S.A. having two maps one with and one without. Nothing on the maps has been named which can be useful for



schools to get the pupils to fill them in but perhaps someone using them for DTP, or even a busy Geography teacher preparing, say, a Genesis file might prefer they were there.

### Colouring the maps

The instructions on how to colour the maps are easy to follow and if you have access to a colour printer or are using them in Genesis, it is well worth the trouble. The map of the U.K. took me only a few minutes to colour and that was my first go, so with

familiarity should be a very simple process. The printouts I did were very good both black and white and colour (using a 24 pin dot-matrix).

### Overall

All in all, this is a package well worth having and I would think a necessity for any school using the Archimedes. The only criticisms I have are the above mentioned lack of rivers and perhaps names. (Maps of the World is £29.95 from Micro Studios Ltd or £28 through Archive.) **A**

## Archimedes' Orrery

### Spacetechn Ltd

*We were very interested to see Spacetechn's latest application at the Acorn User Show and felt that it was worth allowing them to tell us about it rather than waiting for a reviewer to appreciate its good and bad points. We will try to get some user views in due course, so remember that this is not a review of !Orrery but an explanation by the software developers of what their product is all about. Ed.*

### Historical background

The publication in 1543 of Nicolas Copernicus's heliocentric (sun-centred) model of the solar system produced serious objections from leading astronomers who based their science on a Ptolomaic or Earth Centred model. To overcome these objections, several Copernican Planetaria were constructed consisting of globes rotating in a framework to represent the members of the solar system in their approximate relative sizes, motions and positions.

The most famous of these was a late arrival to the scene, invented in 1710 by George Graham and named for his patron, Charles Boyle, Fourth Earl of Orrery. Thus originated the word "Orrery" which is now commonly applied to all instruments of this kind. No significant advance in the development of aids to the understanding of the solar system, orbital mechanics and the night sky were made until the arrival of the projection planetarium, the first example of which was installed in Munich Museum in 1923 and later developed as a commercial projector by Zeiss and installed in museums all over the world.

The mechanical orrery, with its finely engineered mechanism, its many moving parts and elegant

appearance, unfortunately was not only an expensive device, but limited in its application as anything other than a crude demonstration model. Its usefulness in the classroom, or as a tool for the astronomer was, therefore, similarly limited. The planetarium, of course, is anything but a crude demonstration model, but given its size and expense, (the Zeiss projector is 17 feet high, weighs 2.5 tons and has 29000 moving parts, projecting on a dome 49 feet in diameter!) it would not find its way into many classrooms!

### The Spacetechn Orrery

One solution to overcome the limitations of these mechanical devices would be to produce a software model. The Spacetechn application !Orrery uses the power of modern technology, not only to overcome the limitations of the traditional orrery and planetarium, but to implement numerous extra features. It is a computerised model of the solar system which uses the processing and graphics capabilities of the Acorn Archimedes.

Where this application scores over the traditional devices is that it is cheap, portable, accurate and interactive. It is also not only a model which can be used for demonstration purposes but also a fully interactive productivity tool giving accurate and useful astronomical data for any time and date within a realistic time frame (approx. 4000 years).

### Description

The Orrery has two main views; the first is the heliocentric model of the solar system which may be seen from any angle or level of "zoom" against an accurate backdrop of stars.

The second view is the geocentric view of the sky as seen from the earth, from any latitude and longitude. Both views may be set up for any date and time and then viewed either as a fixed frame, animated in real time or animated in accelerated time. Planets are shown as sampled images and their tracks may be displayed either in full, fading according to perspective distance from the viewer, or fading according to the history of their path.

When in heliocentric mode, the viewer may zoom in and out of the solar system, fix the view on either the backdrop to show relative motion and eccentricity of planetary orbits, or on any individual planet to show features such as, deviation from mean position or retrograde motion.

Planets may be shown in their relative sizes and distances from each other and the sun or they may be shown in a perspective view where they change apparent size according to the distance from the viewer. Conditions to show interesting effects or events may be set up by the user and saved to disc. For example, the intersection of the orbits of Pluto and Neptune may clearly be demonstrated in accelerated time, or the movement of the Zodiac constellations can be demonstrated to show how the so-called "star signs" are derived. Several interesting setup files are supplied with the distribution software.

## User interface

The software runs entirely within the RISC-OS

desktop environment and is multi-tasking. Acorn conventions are used for the presentation of menus and so on. In addition there is a "control panel" which allows the user to determine viewing angle, level of zoom and speed of animation. Every object displayed, star or planet, is identifiable merely by pointing at it with the mouse pointer. There is a database of over 500 stars and each planet has extensive information accessible to the user which is dynamically updated to give accurate information referring to the actual time and date of access.

## Output

Output to disc or printer is in the form of !Draw, !Paint or text files. This means that it is easily accessible to other software packages, including the most commonly used desktop ones and the Acorn printer drivers. Output includes images of the current orrery configuration, star maps and ephemeris charts ensuring that students will have plenty of project material after a session with the orrery.

## The National Curriculum

With the introduction of the National Curriculum, a whole science attainment target ('The Earth in Space') is directed towards the type of understanding that this application addresses. With Space Science now becoming a statutory requirement in schools, teachers are casting around for relevant and interesting material which so far is in short supply. We, at Spacetechn, are doing our best to remedy this deficiency. (£95 ex VAT) **A**

Spacetechn	21 West Wools, Portland, Dorset, DT5 2EA. (0305-822753)
SPEM	Via Aosta 86, 10154 Torino, Italy. (Fax 010-39-11-280009)
Superior Software	Regent House, Skinner Lane, Leeds, LS7 1AX. (0532-459453)
TAP Consortium	34 Drake Gardens, Tavistock, Devon, PL19 9AT. (0822-613868)
Techsoft UK Ltd (p12)	Old School Lane, Erryrs, Mold, Clwyd, CH7 4DA. (082-43318)
The Advisory Unit	Endymion Road, Hatfield Herts, AL10 8AU. (07072-65443) (-273651)
The Data Store	6 Chatterton Road, Bromley, Kent. (081-460-8991) (-313-0400)
The Serial Port	Burcott Manor, Wells, Somerset, BA5 1NH. (0243-531194) (-531196)
TooLs GmbH	Kessenicher Strasse 108, D-5300 Bonn 1, West Germany. (+49-228-230088) (-233699)
Video Electronics Ltd	Wigan Road, Atherton, Manchester, M29 0RH. (0942-882332)
Voltmace	Unit 9, Bondor Business Centre, London Road, Baldock, Herts, SG7 6NG. (0462-894410)
Wild Vision	15 Witney Way, Boldon Colliery, Tyne & Wear NE35 9PE. (091-519-1455) (-1929)
Wingpass Ltd	19 Lincoln Avenue, Twickenham, TW2 6NH. (081-898-8355)
XOB	Balkeerie, Eassie by Forfar, Angus, DD8 1SR. (0307-84364)
ZCL Ltd	Unit 1, Ringway Industrial Estate, Eastern Avenue, Lichfield, Staffs. (0543-416626)



# Fact-File

(The numbers in *italic*  
are fax numbers.)

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4mation  
628 Software  
Abacus Training  
Acorn Computers Ltd  
Ace Computing (p45)  
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Digital Services  
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P.R.E.S.  
RESOURCE  
RTFM Software  
Sherston Software  
Silicon Vision Ltd  
Software Solutions (p24)  
Norwich Computer Services
- P.O. Box 4444, Sheffield. (0742-700661)  
Linden Lea, Rock Park, Barnstaple, Devon, EX32 9AQ. (0271-45566)  
24 Mulgrave Road, Whitby, N Yorkshire, YO21 3JS. (0947-602756)  
29 Okus Grove, Upper Stratton, Swindon, Wilts, SN2 6QA.  
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27 Victoria Road, Cambridge, CB4 3BW. (0223-322559)  
The Old Courthouse, Bottisham, Cambridge, CB5 9BA. (0223-811679) (-812713)  
2 Purls Bridge Farm, Manea, Cambridgeshire, PE15 0ND. (035-478-432)  
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23 The Greenway, Orpington, Kent, BR5 2AY. (0689-38852)  
0603-416863 (-788640)  
117 Hatfield Road, St Albans, Herts, AL1 4JS. (0727-40303) (-60263)  
53 Panton Street, Cambridge CB2 1HL. (0223-461143)  
8 Herbrand Street, London, WC1N 1HZ. (071-833-4023) (071-837-6077)  
78 Brighton Road, Worthing, W Sussex, BN11 2EN. (0903-213361) (-213901)  
98 Middlewich Road, Rudheath, Northwich, Cheshire, CW9 7DA. (0606-48511) (-48512)  
149-151 St Neots Road, Hardwick, Cambridge, CB3 7QJ. (0954-211472) (-211607)  
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9 Wayte Street, Cosham, Portsmouth PO6 3BS. (0705-210600)  
23 Justice Mill Lane, Aberdeen AB1 2EQ. (0224-211907) (-211908)  
4 rue de Massacan, 34740 Z.I. Vendargues, France. (010-33 +67 70 53 97)  
34 Drake Gardens, Tavistock, Devon, PL19 9AT. (0822-613868)  
10 Frost Drive, Wirral, L61 4XL. (051-648-6287)  
36 Upland Drive, Plymouth, Devon, PL6 6BD. (0752-847286)  
133 London Road, Staines, Middlesex TW18 4HN.  
14 Perwell Close, Bredon, Tewkesbury, Gloucester, GL20 7LJ. (0684-73173)  
194 Cheney Manor Road, The Green, Swindon SN2 2NZ.  
P.O.Box 10, Halesworth, Suffolk, IP19 0DX. (0986-85-476) (-460)  
Dales Brewery, Gwydir Street, Cambridge, CB1 2LJ. (0223-323656) (-460208)  
22 Churchgate Street, Soham, Ely, Cambridgeshire.  
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Morley House, Norham Road, North Shields, Tyne & Wear, NE29 7TY. (091-257-6355) (-6373)  
Cross Park House, Low Green, Rawdon, Leeds, LS19 6HA. (0532-502615) (-506868)  
9 St Marks Place, London, W11 1NS. (071-221-9653) (-9654)  
6 Ava House, Chobham, Surrey. (0276-72046)  
Exeter Road, Doncaster, DN2 4PY. (0302-340331)  
43 Hill Street, St Helier, Jersey JE2 4UA. (0534-67870) (-68996)  
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